



# INDUSTRIAL MANAGEMENT



Dipak Kumar Bhattacharyya

## INDUSTRIAL MANAGEMENT

 TrueEdu  
Education is life in itself.  
[www.trueedu.in](http://www.trueedu.in)  
+91-7807990100, 7876824418

# INDUSTRIAL MANAGEMENT

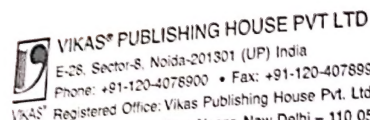
**Dr Dipak Kumar Bhattacharyya**

*Director*

*Camellia B-Schools, Kolkata and Shantiniketan*



VIKAS® PUBLISHING HOUSE PVT LTD



VIKAS\* PUBLISHING HOUSE PVT LTD  
E-28, Sector-8, Noida-201301 (UP) India

Phone: +91-120-4078900 • Fax: +91-120-4078999

Registered Office: Vikas Publishing House Pvt. Ltd. 7361, Ravindra Mansion,

Ram Nagar, New Delhi – 110 055

E-mail: helpline@vikaspublishing.com • Website: www.vikaspublishing.com

**SALES AND BRANCH OFFICES OF VIKAS\* AND S CHAND AND COMPANY LIMITED**

Ahmedabad	: Ph: 27541965, 27542369, ahmedabad@schandpublishing.com
Bengaluru	: Ph: 22268048, 22354008, bangalore@schandpublishing.com
Bhopal	: Ph: 4274723, 4209587, bhopal@schandpublishing.com
Chandigarh	: Ph: 2625356, 2625546, chandigarh@schandpublishing.com
Chennai	: Ph: 43535357, chennai@schandpublishing.com
Coimbatore	: Ph: 2323620, 4217136, coimbatore@schandpublishing.com (Marketing Office)
Cuttack	: Ph: 2332580, 2332581, cuttack@schandpublishing.com
Dehradun	: Ph: 2711101, 2710861, dehradun@schandpublishing.com
Guwahati	: Ph: 2738811, 2735640, guwahati@schandpublishing.com
Hyderabad	: Ph: 27550194, 27550195, hyderabad@schandpublishing.com
Jaipur	: Ph: 2219175, 2219176, jaipur@schandpublishing.com
Jalandhar	: Ph: 2401630, 5000630, jalandhar@schandpublishing.com
Kochi	: Ph: 2378740, 2378207-08, cochin@schandpublishing.com
Kolkata	: Ph: 23353914, 23357458, kolkata@schandpublishing.com
Lucknow	: Ph: 4026791, 4065646, lucknow@schandpublishing.com
Mumbai	: Ph: 22690881, 22610885, mumbai@schandpublishing.com
Nagpur	: Ph: 6451311, 2720523, 2777666, nagpur@schandpublishing.com
Patna	: Ph: 2300489, 2302100, patna@schandpublishing.com
Pune	: Ph: 64017298, pune@schandpublishing.com
Raipur	: Ph: 2443142, raipur@schandpublishing.com (Marketing Office)
Ranchi	: Ph: 2361178, ranchi@schandpublishing.com
Siliguri	: Ph: 2520750, siliguri@schandpublishing.com (Marketing Office)
Visakhapatnam	: Ph: 2782609, visakhapatnam@schandpublishing.com (Marketing Office)

Industrial Management  
ISBN: 978-81-259-3710-4

First Edition 2010  
Reprinted in 2012, 2013  
First Reprint 2018

VIKAS\* is the registered trademark of Vikas Publishing House Pvt Ltd  
Copyright © Author, 2010

All rights reserved. No part of this publication which is material protected by this copyright notice may be reproduced or transmitted or utilized or stored in any form or by any means now known or hereinafter invented, electronic, digital or mechanical, including photocopying, scanning, recording or by any information storage or retrieval system, without prior written permission from the publisher.

Information contained in this book has been published by VIKAS\* Publishing House Pvt Ltd and has been obtained by its Authors from sources believed to be reliable and are correct to the best of their knowledge. However, the Publisher and its Authors shall in no event be liable for any errors, omissions or damages arising out of use of this information and specifically disclaim any implied warranties or merchantability or fitness for any particular use. Disputes if any are subject to Delhi Jurisdiction only.

Printed in India

## About the Book

The subject 'Industrial management' studies the basic concept of management and all other management related aspects, which are considered essential for engineering students. The present book Industrial Management has been developed after browsing through the syllabi of all the universities and technical institutions in India and abroad. Normally, this subject is taught to engineering students in their sixth or seventh semester to make them industry ready. The knowledge of this subject is important to develop an understanding of various functions of management, role of workers and engineers, production and operations functions, quality management, organizational behaviour, industrial relations, etc.

For engineers, proper knowledge of industrial management can bring successful careers. Management inputs strengthen their decision-making powers of engineers in organizations, as it would enable them to understand the techniques of resource optimization to achieve business results. In today's complex business environment, engineering and management issues cannot be segregated. Integration of industrial management with the technicalities of engineering functions yield better results. Every engineer needs to plan, organize, direct, coordinate and control. These activities are in-built with engineers' core functions of production and operations. With management their inputs, engineers can regulate the functions of an organization more effectively.

The core objectives of this book are to:

- Enrich students with sound knowledge and skills and so also the application of industrial management in workplaces.
- Strengthen the critical knowledge of students in selected management areas, important for workplace decision making.
- Reinforce the engineering knowledge and skills with management inputs to enhance the employability of engineering students.
- Develop students' potentiality to groom them as future managers.
- Equip students to learn and apply various managerial tools and techniques for improved decision making.

Keeping in view the need of engineering students, the book is written in simple and lucid language with illustrative examples, models, mathematical problems and its solutions, etc. Each chapter has been sequenced in such a manner, so as to enable the readers to understand its pace and sequence and develop their knowledge scientifically.

The book provides adequate examples to help students relate to their theoretical understandings. At the end of each chapter, key words and relevant questions are provided to test the knowledge of the students. The book would certainly be the most effective keeping in mind the coverage of All-India syllabi from different practical and operational aspects of industrial management for engineering degree and diploma students.

## *Dedicated to*

Sutapa, Sudip and Tapodeep —  
three masterminds who shape my ideas

## **Preface**

My primary motivation to write a book on the topic of 'Industrial management' for the engineering students stemmed from my long experience in the training functions of Indian Ordnance Factories, where I have seen how even the most well-skilled engineers feel shaky in an operational environment for lack of knowledge of managerial issues. Since then I have been nurturing the idea of developing such a text in a simple and lucid language to help the undergraduate engineering students understand the basics of management.

The book contains twenty-three chapters that cover all aspects of all-India level syllabi and even match with the global course requirements.

In twenty-three chapters, the book elaborates on all the facets of industrial management. This would truly help engineers to integrate their engineering expertise with management skills and groom them as future managers of the organizations.

Writing this book would not have been possible without the active support of my friends and colleagues. I gratefully acknowledge the contributions made by my colleagues at Camellia Group, especially Mr N.R. Datta, Chairman and Managing Director and the faculty members of Management and Engineering Colleges of the Camellia Group. Prof. Sudipti Banerjee, Department of Commerce, University of Calcutta, Prof. Sanjoy Bhattacharyya, Director, National Institute for Technical Teachers' Training and Research, Prof. C.T. Bhunia, Director of BITM, Shantiniketan, Prof. S. Sengupta, Director, CIT, Prof. Abir Chatterjee, Principal, CSCT, Prof. N.C. De Sarkar, Principal, CITM deserve special mention. I am also highly indebted to my family members for their immense cooperation and support during the time when I was developing this manuscript. Last but not the least, I would be failing in my duty if I did not mention my publisher Vikas Publishing House, whose support could make this book possible.

I will gratefully acknowledge and criticism/suggestions to improve the future editions of this book.

**Dr D K Bhattacharyya**

e-mail: [dkbhattacharyya@yahoo.co.in](mailto:dkbhattacharyya@yahoo.co.in)

# Contents

About the book v

Preface vii

## 1. Introduction to Industrial Management: Concept, Nature, Process and Significance

Introduction .....	1
Nature of Management and Its Process .....	3
Management Functions and Process .....	5
Important Characteristics and Features of Management .....	9
Management-Science or Art .....	14
Management as a Profession .....	14
Pre-Classical Approach .....	15
Classical School Of Thought .....	16
Neo-Classical School of Thought .....	21
Modern Approaches .....	24
Contemporary School of Management Thoughts .....	26
Managerial Roles .....	28
Managerial Skills and Competencies .....	29
Management by Objectives (MBO) .....	31
Summary .....	32
Key Words .....	32
Review Questions .....	33
References .....	34

## 2. Organizational Planning

Introduction .....	35
Importance of Planning .....	36
Components of Planning .....	37
Decision Making .....	55
Management Information System (MIS) and Decision Support System (DSS) .....	58
Limitations of Planning .....	58
Summary .....	59
Key Words .....	60
Review Questions .....	61
References .....	62

## 3. Organizing

Introduction .....	63
Definitions of Organizing .....	64
Basic Organizing Principles .....	65

Human Factors in Organizing .....	66
Important Steps in Organizing .....	66
Importance and Benefits of Organizing Function .....	66
Types of Organization .....	67
Theories of Organization .....	68
Organizational Structure .....	70
Organizational Effectiveness and Organizational Structure .....	74
Dynamic Organization Structure and Departmentation .....	75
Organizing as Part of the Total Management Task .....	84
Delegation of Authority .....	84
Span of Management .....	94
Open Systems Approach in Organization .....	98
Summary .....	99
Key Words .....	101
Review Questions .....	101
References .....	102

#### 4. Staffing in Organization

Introduction .....	103
Recruitment .....	103
Summary .....	127
Key Words .....	127
Review Questions .....	128
References .....	129
Appendix 4.1 .....	129

#### 5. Direction and Motivation in Organization

Introduction .....	132
Meaning and Characteristics of Direction .....	132
Motivation in Organization .....	133
Summary .....	158
Key Words .....	158
Review Questions .....	158
References .....	159

#### 6. Leadership

Introduction .....	160
Definitions and Characteristics .....	161
Leadership and Management .....	163
Formal and Informal Leaders .....	165
Significance of Leadership .....	165
Principles of Leadership .....	166
Factors of Leadership .....	167
Functioning of Leadership .....	169
Leadership and Power .....	171
Leadership Styles .....	171
Leadership Attitudes .....	173
Leadership Skill .....	174
Leadership Theories .....	175

Contributors to the Leadership Theories .....	176
Famous Studies on Leadership .....	177
Miscellaneous Theories of Leadership .....	182
Language of Leaders .....	185
Summary .....	185
Review Questions .....	186
References .....	186

#### 7. Organizational Control

Introduction .....	188
Definitions of Control .....	189
Characteristics of Control .....	190
Essentials of Good Control .....	191
Prerequisites of Good Control System .....	193
Three Types of Control .....	193
Steps in Control .....	195
Methods for Control .....	197
Importance of Control .....	199
Shortcomings of Control .....	200
Tools and Techniques of Control .....	201
Budgetary Control .....	202
Summary .....	204
Key Words .....	204
Review Questions .....	205
References .....	205

#### 8. Coordination in Organizations

Introduction .....	206
Definitions .....	206
Nature and Characteristics .....	207
Needs, Importance and Significance of Coordination .....	209
Principles of Coordination .....	211
Objectives and Purposes of Coordination .....	212
Types of Coordination .....	213
Tools for Better Coordination .....	215
Summary .....	215
Key Words .....	216
Review Questions .....	217
References .....	217

#### 9. Forms of Organization

Introduction .....	218
Sole Proprietorship .....	219
Partnership .....	220
Joint Stock Company or Corporation .....	221
Cooperative Organization .....	222
Multinational/Transnational Organizations .....	223
Features of International Organizations .....	226
Summary .....	227

Key Words .....	228
Review Questions .....	228
References .....	228
<b>10. Introduction to Human Resource Management</b>	
Introduction .....	230
History of HRM .....	230
Development Process of HRM .....	231
Factors Responsible for Development of HRM .....	233
HRD as a Separate Personnel Department .....	235
Summary .....	250
Key Words .....	250
Review Questions .....	250
Reference .....	251
<b>11. Organizational Behaviour and Employee Perception</b>	
Introduction .....	252
Perception as a Process .....	254
Perception and Individual Decision Making .....	258
Scenario Planning and Individual Perception of Managers .....	261
Summary .....	263
Key Words .....	264
Review Questions .....	264
References .....	264
<b>12. Training, Development and Performance Appraisal</b>	
Introduction .....	266
Definition and Purposes .....	267
Need for Manpower Training .....	267
Classification of Training Programmes .....	268
Steps for Designing the Training Programme .....	270
Sequence of a Training Programme .....	271
Need for a Training Policy .....	271
Training Methods .....	272
Performance Appraisal .....	274
Performance Counselling .....	280
Summary .....	282
Key Words .....	283
Review Questions .....	283
References .....	284
Appendix 12.1 .....	285
Appendix 12.2 .....	286
<b>13. Communication in Organizations</b>	
Introduction .....	287
Definition and Concepts .....	288
Elements of Communication .....	288
Nature of Communication .....	289
Effective Communication .....	289

Organizational Communication .....	290
Psychological and Behavioural Influence on Communication .....	293
Group Communications .....	294
Communication Barriers .....	295
Transactional Analysis .....	299
Negotiation .....	302
Summary .....	304
Key Words .....	305
Review Questions .....	305
References .....	306
<b>14. Industrial Relations (IR) and Labour Welfare</b>	
Introduction .....	307
Industrial Relations and Labour Welfare in India .....	308
Labour Laws and Acts .....	309
Trade Unions .....	315
Absenteeism .....	322
Labour Turnover .....	323
Scheme for Participation of Workers' In Management .....	324
General Policy on Industrial Relations .....	324
Code of Discipline in Industry .....	325
Collective Bargaining .....	326
Summary .....	331
Key Words .....	332
Review Questions .....	332
References .....	333
<b>15. Introduction to Production and Operations Management</b>	
Introduction .....	334
Models for Production and Operations Systems .....	338
Interrelationship of POM with Other Management Functions .....	339
Production System .....	339
Manufacturing Plant .....	339
Operations Management .....	340
Operations Strategy .....	342
Operational Control Systems .....	343
Role of Operations Manager .....	344
Summary .....	345
Key Words .....	345
Review Questions .....	346
References .....	346
Appendix 15.1 .....	346
<b>16. Production Planning and Control</b>	<b>348</b>
Introduction .....	348
Production Planning .....	349
Objectives of Production Control .....	350
Functions of Production Control .....	351
Routing .....	352

Aggregate Planning .....	353
Master Production Schedule (MPS) .....	355
Capacity and Material Requirement Planning .....	355
Capacity Planning .....	356
Process of Capacity Measurement .....	358
Different Types of Capacity .....	358
Materials Requirement Planning (MRP) .....	360
Manufacturing Resource Planning (MRP-II) .....	361
Production-Related Forms .....	361
Summary .....	362
Key Words .....	363
Review Questions .....	364
References .....	364
<b>17. New Product Planning and Development</b> .....	
Introduction .....	365
New Product Selection or Development Process .....	366
Product/Service Life Cycle Analysis .....	368
Process Selection .....	369
Break-Even Analysis .....	370
Summary .....	372
Key Words .....	373
Review Questions .....	373
References .....	374
<b>18. Scheduling and Sequencing of Production</b> .....	
Introduction .....	375
Assignment or Job Loading .....	375
Index Method .....	378
Job Sequencing or Prioritization .....	379
Network Analysis .....	388
Crashing of Project .....	397
Definition of a Project .....	397
Main Characteristics of a Project .....	398
Project Life Cycle .....	399
Project Management .....	399
Summary .....	400
Key Words .....	400
Review Questions .....	401
References .....	402
<b>19. Work Study</b> .....	
Introduction .....	403
Human Context of Work Study—Trade Unions' Response .....	404
Method Study .....	404
Work Measurement .....	408
Concept and Definition of Ergonomics .....	410
Motion Economy .....	413
Human Engineering .....	415

Value Analysis .....	416
Summary .....	418
Key Words .....	419
Review Questions .....	419
References .....	420

## 20. Maintenance Management

Introduction .....	421
Different Types of Maintenance .....	422
Need for Maintenance Policy .....	424
Spare Parts Planning and Control in Maintenance .....	424
Reliabilities .....	430
Types of Equipment Failure .....	430
Descriptive Methods Used in Maintenance Management .....	431
Summary .....	436
Key Words .....	437
Review Questions .....	437
References .....	438

## 21. Quality Management Practices

Introduction .....	439
What is Quality? .....	440
Product Quality to Quality Management .....	442
ISO Standards .....	443
Quality Gurus and Their Contribution to TQM Practices .....	445
Teams and Teamwork .....	452
Employee Empowerment .....	452
Quality of Work Life (QWL) .....	453
Quality and Six-Sigma Practices .....	454
Quality and Innovation and Creativity .....	454
Quality Circles and Total Employee Involvement .....	455
Statistical Process Control .....	458
Sampling .....	459
Operating Characteristic Curve .....	459
Control Charts .....	461
Productivity .....	466
Summary .....	473
Key Words .....	474
Review Questions .....	474
References .....	475

## 22. Marketing Management

Introduction .....	476
Scope of Marketing Functions .....	477
Difference between Marketing and Selling .....	478
Functions of Marketing Manager .....	479
Market Analysis .....	479
Market Size .....	479
Market Growth Rate .....	480

Market Profitability .....	480
Industry Cost Structure .....	480
Distribution Channels .....	481
Market Trends .....	481
Key Success Factors .....	481
Market Segmentation .....	481
The Marketing Mix .....	485
Strategic Planning—The Link with Marketing .....	486
Why is Marketing Planning Essential .....	487
SWOT Analysis .....	488
Internal Analysis .....	489
External Analysis .....	489
The BCG Growth-Share Matrix .....	490
The McKinsey/General Electric Matrix or Industry Matrix .....	492
Ansoff's Product/Market Matrix .....	493
Pest Analysis .....	495
Marketing Environment .....	496
Michel Porter's Five Competitive Forces Analysis .....	498
Summary .....	499
Key Words .....	499
Review Questions .....	500
References .....	500

### 23. Materials Management and Inventory Control

Introduction .....	501
Materials Management—Definition and Concepts .....	502
Selective Inventory Control .....	504
Economic Ordering Quantity .....	510
Supply Chain Management and Inventory Control .....	517
Lead Time .....	518
Just-In-Time .....	518
Summary .....	518
Key Words .....	519
Review Questions .....	520
References .....	520

Index .....	521
-------------	-----

# 1

## Introduction to Industrial Management: Concept, Nature, Process and Significance

### LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand the management, its concepts and process
- understand various functions of management
- discuss important characteristic features of management
- know different dimensions of management
- appreciate the importance of basic management to study organizational structure and systems
- explain the process of development of various management thoughts
- differentiate between various management thoughts
- critically evaluate various management thoughts
- discuss modern management thoughts

### INTRODUCTION

The term 'industrial management' is more relevant for engineering students, as it primarily focuses on operational aspects of management theories. However, to understand the basics of industrial management, it is desirable that students first understand the basic concept of management, its evolution and also why we must study it. Today's organizations need to apply management practices to achieve their goals and objectives. Application of management theories and concepts are now all pervasive and all encompassing. With best engineering skills and knowledge, professionals cannot just sustain since any operational issues require application of management techniques. Any engineer, by profession is also a manager, as engineers also

qualify in the classical test of managerial roles of Mintzberg, i.e., interpersonal role, informational role and decisional role. In their interpersonal role, engineers need to interact and communicate with the people (both working under and above them) and manage their behaviour to get the desired results. Engineers' informational role is to collect, monitor and disseminate information to keep their workplace updated with the global changes. And every engineer needs to take decision, now and then, as a part of his job. For all these reasons, the study of industrial management is important for engineers as they are the future managers for the organizations. Often, it is debated that management knowledge is in-built; hence, it requires no formal study of theories and concepts. We can refute the statement all together. However, engineers gain application-based management knowledge through job experience. These knowledge inputs are very specific to their workplace. Hence, we cannot call it validated management knowledge. Pre-understanding of the concepts and theories reinforced with the industry practices, make engineers more matured professionals. Hence, every engineer must be exposed to the management education.

Organization is made up of group of people with some specific goals, objectives and activities. Also, organization is defined as relations among components of a system. Organizational structure denotes the components and relations that bind people working in the organization. Three pillars of organization are people, organization itself and technology. Issues regarding people encompass education, training and attitudes. Organizational issues cover strategy, policy, culture and bureaucracy. Technological issues are hardware, software, telecommunications and information systems. Three different levels of organizational structure are strategic, tactical and operational. Strategic level represents decision-making level, i.e., the corporate or the top level of an organization. Tactical or business level is the middle management level, where strategic decisions are transformed into tactics to achieve the strategic intents. Operational level represents the actual implementation level, where the first-level employees and workers execute the tactics adopting the actions plans.

Organizational behaviour is the analysis of an organization's structure and functions and the behaviour of its people. Behavioural study encompasses both the group and the individuals. Theoretically, it is difficult to draw a borderline between management and organizational behaviour. Rather, it can be said that one supplements the other. A couple of issues regarding organizational behaviour has its root in the management process. In fact, management studies have begun much before the start of the study of organizational behaviour. The study of organizational behaviour has its beginning from the middle of 12th century. Major focus of organizational behaviour studies, therefore, borrow the support from management theories to understand the regulating features of structure, behaviour of people and the issues concerning external and internal fit.

A successful managing of organizational behaviour largely depends on the management practices prevailing in an organization. Understanding the basics of management, therefore, precedes understanding the organizational behaviour. In the first two chapters, we shall discuss on basics and genesis of management to pave the foundation of our knowledge on organizational behaviour.

Let us know understand how the concept of management has emerged. Tracing history, we find, before industrial revolution (which occurred in Europe in mid-1700s), people used to manage their own economic activity through

home-centred production system. They themselves were the owners of labour services and of means of capital. Participation being spontaneous (work being their own) and activities being small (confined within the family members), management as a significant human activity did not get recognized then. With the advancement of technology, communication, transportation, market domain had expanded beyond the neighbourhood areas. It was at this time only, the need for more organized production activity in the form of factory-centred production system had emerged. People then started working in groups to accomplish goals. It was then not possible to achieve goals, working as individuals or individual households. Management then became an inevitable task to bring coordination between the individual efforts in groups.

With the increase in global competition and advancement of technology, the task of managers is becoming more and more important. In this chapter, we have first discussed the definition and concept of management and subsequently elaborated on management thoughts with emphasis on Taylor, Fayol, Mayo, Follet and Max Weber.

### NATURE OF MANAGEMENT AND ITS PROCESS

Human needs are largely satisfied through economic activities of organized groups and associations. In our own interest, we join together and accomplish goals through cooperation. In this pursuit, however, to be more effective, it is essential that a group efforts is properly organized, directed and coordinated, i.e., there is a need for management. Therefore, it can be said that management is as old as the civilization or organized life. Systematic study of management, however, is the product of six or seven decades.

Particularly, after World War II, the literature on management has grown at an unprecedented rate. This, in turn, has greatly helped in improving research, teaching and practice. But such a growth has also added to differences of opinion and controversies. Ranging from the operational school of management thought to the mathematical school, one comes across the human behaviour school, the systems school and the decision theory school. These divergent views relating to management have made the task of defining management extremely difficult. Operationally, management may be defined as:

*A dynamic process, that helps to get the things done, through and with the efforts of people.*

However this definition suffers from the test of inadequacy. In this competitive world, management as a process helps in optimizing scarce resources, i.e., all the inputs, to achieve the intended goals and objectives of the organizations.

Today, management efficiency distinguishes one organization from another as it adds to the competitive strength of the latter. Management has been defined by different authorities differently; but irrespective of differences in approaches and environment, management process is essentially the same in all organized activities and at all levels in an organization.

### Meaning and Process

Before going into the details, let us first review the definitions of management given by different experts in the field. Here the definitions are given chronologically and are subsequently categorized into different approaches.

**F.W. Taylor**, the father of scientific management, defined management as 'the art of knowing what you want to do ... in the best and cheapest way.' According to **R.C. Davis**, 'Management is the function of executive leadership anywhere.' On the other hand, **E.F.L. Brech**, opined 'Management is concerned with seeing that the job gets done; its tasks all centred on planning and guiding the operations that are going on in the enterprise.' **Peter Drucker** (1954) in an attempt to narrow the debate, defined management as, 'It is a multi-purpose organ that manages a business and manages managers and manages worker and work.' According to **William Spriegel**, 'Management is that function of an enterprise which concerns itself with the direction and control of various activities to attain the business objectives. Management is essentially an executive function; it deals particularly with the active direction of the human effort ...'. **Mary Cushing Niles** said that 'Good management, or scientific management, achieves a social objective with the best use of human and material energy and time and with satisfaction for the participants and the public.' Reinforcing this logic further, **Lawrence A. Appley** also defined management as 'the development of people and not the direction of things ... Management is personnel administration.' According to **Stanley Vance**, 'Management is simply the process of decision making and control over action of human beings for the express purpose of attaining pre-determined goals.' **Harold Koontz** (1961) defined management as 'the art of getting things done through and with people in formally organized groups. It is the art of creating the environment in which people can perform and individuals could cooperate towards attaining of group goals. It is the art of removing blocks to such performance, a way of optimizing efficiency in reaching goals.' **John F. Mee** defined management as '... the art of securing maximum results with a minimum of effort so as to secure maximum prosperity and happiness for both employer and employee and give the public the best possible service.' **James L. Lundy** opined that 'Management is principally the task of planning, coordinating, motivating and controlling the efforts of others towards a specific objective.' **Prof. A. Dasgupta** (1969), the father of Indian Management Education, defined management as 'the creation and control of technological and human environment of an organization in which human skill and capacities of individuals and groups find full scope for their effective use in order to accomplish the objectives for which an enterprise has been set up. It is involved in the relationships of the individual, group, the organization and the environment.' **Dalton E. McFarland** defined management '... as that process by which managers create, direct, maintain, and operate purposive organizations through systematic, coordinated, cooperative human effort.' According to **Theo Haimann** and **William G. Scott**, 'Management is a social and technical process which utilizes resources, influences human action and facilitates changes in order to accomplish organization goals.' **Joseph Massie** (1973) defined management as '... the process by which a cooperative group directs action towards common goals.' **Robert L. Trewatha** and **M. Gene Newport** defined management as '... the process of planning, organizing, actuating, and controlling an organization's operations in order to achieve a coordination of the human and material resources essential in the effective and efficient attainment of objectives.' **Howard M. Carlisle** defined management as '... the process by which the elements of a group are integrated, coordinated, and/or utilized so as to effectively and efficiently achieve organizational objective.' According to **George R. Terry**, 'Management is a distinct

process consisting of planning, organizing, actuating, and controlling, performed to determine and accomplish the objectives by the use of people and resources.'

Reviewing the definitions, it can be observed that management basically converges on accomplishing goals and objectives through the efforts of people. Further reviewing reveals that the definition of management has following different dimensions—

- Productivity Orientation:** Frederick Winslow Taylor and John F. Mee have pioneered this concept. Their definitions are primarily concerned with increased productivity.
- Human Relations' Orientation:** This concept was pioneered by Lawrence A. Appley and Harold Knootz. Their definitions of management primarily lays emphasis on people.
- 'Decision-making' Orientation:** Definitions under this category focus on decision making as primary management function. Ross Moore and Stanley Vance pioneered this concept.
- Leadership Orientation:** Leadership as essence of management has been highlighted by the proponents of this concept. Donald J. Clough and Ralph C. Davis are two pioneers, who relate management with leadership.
- Process Orientation:** Management as a process has been defined by numerous authors like James L. Lundy, Dalton E. McFarland, Howard M. Carlisle, F.E.L. Brech, Robert L. Trewatha, M. Gene Newport and George R. Terry.

Till now, we have only discussed about different definitions and the orientation of management. After reviewing the various definitions provided by various experts, we can decide upon one appropriate definition of management in order to avoid any kind of confusion. It can be said that *management is optimization of constraining resources to achieve some intended goals*. 'Resources' is a broad term and it encompasses everything that we require as inputs (including knowledge and information inputs). Resources are not available in abundance. There always exist resource constraints. Every organization through its efficient management tries to achieve its chartered goals and objectives by proper allocation of resources. Goals and objectives emanate from the strategic plan of an organization, which has been discussed in the chapter on Planning.

### MANAGEMENT FUNCTIONS AND PROCESS

Functions relating to activities such as production, purchasing, selling, advertising, finance and accounting differ from one enterprise to another. But functions of management are common to all business units and non-profit organizations. Henri Fayol, the founder of modern management theory, divided all activities of organization into six groups:

- Technical
- Commercial
- Financial
- Security
- Accounting
- Managerial

Fayol has distinguished between the principles and elements of management. Principles are rules and guidelines, whereas, elements are functions of management. Fayol has grouped the elements into five managerial functions of (i) Planning, (ii) Organizing, (iii) Commanding, (iv) Coordinating and (v) Controlling. This classification of Fayol has been widely accepted. Luther Gullick used the term POSDCROB to describe management functions. Initial letters of the term indicate management functions, viz., Planning (P), Organizing (O), Staffing (S), Directing (D), Coordinating (CO), Reporting (R) and Budgeting (B). Reporting is a part of control function. Budgeting represents both planning and controlling. Newman and Summer also classified the management process into the functions of organizing, planning, leading and controlling. The most useful method of classifying managerial functions is to group them around the components of planning, organizing, staffing, directing and controlling.

Above functions of management are common to all business enterprise and organizations and to other fields as well, but the manner in which these are carried out will not be the same in different organizations. All these functions constitute the job of a manager: relative importance of each of them varies from time to time. Thus, tight economic conditions might force a firm to lay more emphasis on control for the time being, whereas a growing concern may have to devote more to organizational problems.

Another way of describing management functions is to consider it as a process. As a process, management refers to a series of interrelated functions, i.e., planning, organizing, staffing, leading, coordinating and controlling.

### Planning

Planning is deciding in advance what is to be done, how and when it is to be done. It involves projecting the future course of action for the business as a whole and also for different sections within it. Planning is thus the preparatory step for actions and helps in bridging the gap between the present and the future. Since planning is essentially choosing, it is dependent upon the availability of alternatives. It is through this process of choosing that the decision making can obviously be seen as an important aspect of planning. Thus, planning is an intellectual process and signifies the use of rational approach to the solution of any problem. In a more concrete sense, planning process comprises of determination and laying down of (i) objectives, (ii) policies, (iii) procedures, (iv) rules, (v) programmes, (vi) budgets and (vii) strategies. A management might plan for both short run and long run. For improved efficiency and better results, short-run plans should be properly coordinated with long-run plans.

Planning is a fundamental function of management. All other functions of management are greatly influenced by the planning process. Importance of planning is amply manifested by increasing interest evinced in planning in business. Very often, planning process is erroneously described to be the prerogative of the top management. However, the fact is that planning permeates all levels in the organization, and every manager irrespective of his position in the management hierarchy must plan within the limits of his authority and decisions of his seniors.

### Organizing

Organizing is the next function of management. It may be conceived as the structuring of functions and duties to be performed by a group of people for the purpose of attaining enterprise objectives. Functions and activities of the enterprise depend upon objectives to be accomplished and are also directed towards the fulfilment of such objectives. This necessitates the establishment of activity-authority relation through the enterprise.

More specifically, organizing function of management involves the following steps:

- (a) Determination of activities of the enterprise keeping in view of its objectives
- (b) Classification of such activities into convenient groups for the purpose of division
- (c) Assignment of these groups of activities to individuals
- (d) Delegation of authority and fixing of responsibility for carrying out such assigned duties
- (e) Coordination of these activities and authority relations throughout the organization

Thus, division of work among people and coordination of their efforts to achieve specific objectives are the fundamental aspects of an organization. Problems arise only when group efforts are not involved. One-man activities cannot possibly be organized in the sense in which the term is used. Similarly, organization is always intended to achieve objectives, and it is a means to an end and never an end in itself. For better results it is, therefore, implied that organization should be based upon practical prudence and sound application of organizational principles.

### Staffing

Organizing as a function of management helps the executive to establish positions and lay down their functional relations to each other. However, it is through staffing function that different positions in the organization structure are kept manned. Staffing process, therefore, provides the organization with adequate, competent and qualified personnel at all levels in the enterprise. Since successful performance by individuals largely determines success of the structure, staffing function deserves sufficient care and attention of the management. It implies that managers should properly estimate the manpower requirements of the organization consistent with the qualifications expected for proper and efficient discharge of duties on existing and possible jobs in the organization, lay down suitable selection and placement procedures, develop employee skills through training and appraisal schemes and should also devise suitable schemes of compensation.

Staffing is a continuous function. A new enterprise has to employ people to fill in the positions that are being generated in the organization. In established enterprises, retirement of employees or death of any employee and also the frequent changes in objective and in the organization itself make staffing a continuous function of management.

### Direction

Mere planning, organizing and staffing are not sufficient to set the tasks in motion. Management have well-coordinated plans, properly established duties and authority relations and able personnel, yet it is through the function of direction that the manager is able to get the employees accomplish their tasks by making them integrate their individual efforts to the interest and objectives of the enterprise. It calls for properly motivating, communicating and leading the subordinates. Motivation induces and inspires employees for better performance, whereas, through good leadership, a manager is able to make the employees work with zeal and confidence.

Directing the subordinates embrace three essential activities:

- (a) Issuing of orders and instructions
- (b) Guiding and counselling the subordinates in their work with a view to improving their performance
- (c) Supervising the work of subordinates to ensure that it conforms to plans

### Control

While giving direction to subordinates, a manager explains the work expected from each of them and also helps them do their respective jobs so that enterprise objectives can be achieved according to the best of their abilities. But even then there is no guarantee that work will always proceed according to plans. It is this possibility of actions deviating from plan that calls for constant observation of actual performance so that appropriate steps may be taken to make them conform to plans. Thus, the controlling task of management involves compelling the events to conform to plans. The important steps to be initiated in the direction are as follows:

- (a) Measurement of accomplishment against the standard and recording of deviations
- (b) Analysing and probing the reasons for such deviations
- (c) Fixing of responsibility in terms of persons responsible for negative deviations
- (d) Correction of employee performance so that group goals and plans devised to attain them are accomplished

Control is thus closely related to the planning job of the manager. However, it should not be viewed merely as a post mortem of past achievements and performance. In fact, a good control system should suggest corrective measures so that negative deviations may not recur in future. The principle of feedback when incorporated in the control system can be of great use in this direction.

### Coordination

Coordination as a separate function of management has been advocated by many authorities including Henri Fayol. However, since coordination is all pervasive and it encompasses every function of management, it is better considered as an important managerial essence than a separate management function. Poor

coordination is attributed to the failure of performing all the management functions vacationed before.

Coordination deals with harmonizing the work relations and efforts at all levels for some common purpose. It may be described as unifying and achieving harmony of individual efforts for the purpose of accomplishing group goals. The whole idea of coordination is to adjust, reconcile and synchronize individual efforts, so that group efforts become more effective. This helps in achieving some common objectives.

Sometimes, coordination is confused with cooperation and it is thought, though erroneously, that if there is cooperation, coordination will automatically follow. Though, cooperation helps in achieving coordination, it is by no means the sole condition for the latter to follow. One can take the example of a cricket match. Without coordinated efforts on the part of players, it is difficult for the team to win a match. Coordination cannot happen spontaneously. First, the differences in understanding, approach, timing, interest or efforts have to be reconciled during synchronizing the individual efforts.

While managing, a manager coordinates the work of his subordinates. For better results following guidelines are suggested:

- (a) Coordination should be viewed as a responsibility of every manager right from the bottom to the top and every individual should know how his job contributes towards accomplishing the objectives of his department and also the dominant goals of the enterprise. Even when a supervisor is able to accomplish the objectives of his department, he should realize that his achievement is nothing unless combined with the achievements of the other units. The combined effort of all individuals contribute to the attainment of high level objectives of the organization. Thus, every manager should understand and appreciate hierarchy of objectives.
- (b) Individual efforts are more easily synchronized if coordination is achieved in early stages of planning and policy making. Thus, where production and marketing policies are at cross ends, coordination between the two groups of activities will be a serious problem.
- (c) Coordination is better achieved through understanding of interpersonal, horizontal rather than vertical relationships of people in the organization and by issue of orders for coordination.
- (d) Another essential requirement for good coordination is good communication. As a result of constant change in the business environment, plans and policies are frequently revised and compromises and adjustments are made. Sometimes, information is not communicated well in time. In that case, unifying individual efforts for accomplishment of enterprise goals becomes difficult without this communication.

### IMPORTANT CHARACTERISTICS AND FEATURES OF MANAGEMENT

In the context of various definitions of management and subsequent discussions, we can enumerate important characteristics and features of management as follows:

## Management Is Organized Activities

Management is essentially a group effort. Unless groups are properly organized through proper coordination and control, management loses its essence. Proper organization of activities with a clear structure showing authoritative relationships is important for managing an organization.

## Management Is Aligned with Organizational Objectives

Every organization develops clearly stated objectives. Peter Drucker had put emphasis on management by objectives (MBO) for achieving results in organization. For deciding the objectives of an organization, a participative approach is followed to increase the commitment from all cross-sections of employees working in an organization. MBO, though, traditionally emphasizes on deciding the objectives at the corporate or highest level in the organization, in order to make it participative, we frame Key Result Areas (KRAs)/Key Performance Areas (KPA's) for individual employees of the organization. KRAs/KPA's are individual qualitative and quantitative targets and are mutually decided by the superior and subordinates. KRAs/KPA's are framed within the ambit of MBO. Aggregation of KRAs/KPA's leads to the achievement of MBO.

## Management Optimizes Constraining Resources

Appropriate resource allocation and optimization of those resources is another important feature of management. Objectives are set, keeping in view the resource constraints. Manager has to rationalize the utilization of constraining resources, so as to achieve best results. Let us understand this with an illustration. Suppose a manager has two options before him: one is to buy new technology with huge capital investment and another is to sub-contract or outsource the job. Capital investment will require the organization to borrow the fund required, pay-back period of which is more than ten years, whereas sub-contracting will enable the organization to manage the activity, once proper vendor is identified. If the manager faces this situation, what will he do? He will obviously go for the second option as there are examples of many companies who have done very well by even outsourcing their manufacturing activities.

## Management Works with and through People

Organization is not just brick and mortar, nor is it just system and structure. It consists of its people or employees. The competitive advantage of any organization is its people. Hence, managing people successfully is the most important priority for an organization. More than two centuries old *Encyclopedia Britannica* collapsed because it could not succeed to manage its people to respond to change. When Microsoft's sister concern Encarta introduced CD version of *Encyclopedia* in the market, Britannica could not respond to this change positively, as the CD version would have reduced the commission income of its sales force. Ultimately, the company had to sell its stake to another new investor at less than half of its price. Therefore, without taking people or employees into confidence, a manager cannot succeed.

## Management Is about Decision Making

One of the most important tasks of a manager is decision making. A manager has to evaluate various decision alternatives and select the best one. Proper decision making minimizes the risk. Various decision-making tools have been discussed in a separate chapter later in the book.

## Management Is a Science as well as an Art

Management is both a science and an art. Learning of management is possible through a scientific process. Management as a discipline is a science. However, effective application of management is an art. That is why managerial styles differ. A manager may be too formal with subordinates and maintain task-oriented relationship while another may be informal and people oriented. Both may lead to results but a long-term effectiveness is achieved only through people orientation.

## Management Is Universal

Management encompasses everything, not merely a business organization. Even for managing a temple or a church or a mosque, one has to apply management principles, though approaches may differ. Universality also implies transferability of management knowledge and skills across countries. There are arguments for and against universality of management principles. Proponents of cross-cultural management are against universality of management as they consider management to be situational and there is nothing like universal principles of management. However, those who subscribe to the concept of universality of management suggest that management is universal and can be found in all types of organizations.

## Management Is Intangible

Management is not something tangible or visible; it is intangible. It is an intellectual process to facilitate proper functioning of an organization. Information and knowledge are key elements of management, and these are now most important inputs. Entire process of management, i.e., planning, organizing, staffing, direction, etc., are intangible inputs, which add value to the organization.

## Management Is an Interdisciplinary Approach

Management is a structured approach encompassing different fields like, Political Science, Economics, Sociology, Psychology, Mathematics and Statistics, Anthropology and even Engineering. Inputs from all these disciplines have strengthened management and managerial functions.

## Management Is a Social Process

As a social process management has to be responsive to the social needs. *Social Responsibility of Organization* is now a well-developed concept which requires management to take inputs from society and give outputs to society. Social well-being can be related with the quality of management. Efficient management through proper utilization of resources of society can improve the quality of life.

Prof. A. Dasgupta pointed out that the activities of every enterprise 'must be so conducted that it can serve its own objectives as well as social purpose.' Social responsibilities of management are not always fixed. They keep on changing. To focus on the importance of social responsiveness of an enterprise, Keith Davis and William C. Frederick said that social responsiveness is 'the ability of a corporation to relate its operations and policies to the social environment in ways that are mutually beneficial to the company and to the society.' It is measured in terms of organizational contributions to charitable and civic projects like assisting voluntary social organizations or non-governmental organizations (NGOs) in fund raising, emphasis on employee involvement in civic activities, and equal employment opportunity, extent of fair treatment of employees, fair pay and safe working conditions, safe and quality products to consumers, pollution avoidance and control. Howard R. Bowen advocated the concept of social audit defining it as 'a commitment to systematic assessment of and reporting on some meaningful, definable domain of the company's activities that have social impact.' It is distinguished in two types:

- (i) those required by the government
- (ii) those which are voluntary in nature

Since organizational social responsibility and responsiveness ultimately depend on the ethical standards of managers, many organizations in order to make them more socially responsive, try to impart training on managerial ethics and values also.

### Management Is a System of Authority

Management involves decision making. In any organization, the onus of decision making ultimately lies with management. Traditionally, organizational structure, therefore, puts management on the top, from where authority and reporting relationships flow. Even though now-a-days we try to make more participative organization diluting the power through horizontal, matrix and also to some extent hybrid organizational structure, the ultimate planning and controlling functions still rest with management personnel.

### Management Is Dynamic

An organization has to relate to the environmental forces that exist around it. Therefore, to adapt to the changes, an organization has to be dynamic. Without a dynamic approach, an organization may lose its competitive advantage. Using SWOT (strength, weakness, opportunities and threat) model, BCG (Boston Consulting Group) matrix or Porter's model, an organization decides its course of action to respond to the changing requirements and frame their plans and strategies accordingly.

### Management Principles Are Relative and Not Absolute

Management principles are not absolute. It depends on the situation. Each organization may have different situation than others. Difference may be for time, place, socio-cultural factors. Therefore, principles of management should be in the light of prevailing culture or situations. Let us explain this using one example. If a multinational organization in Peru wants to apply the principles, which are

applicable for their US operations, the results are more likely to be disastrous because of the difference in the working conditions between the US and Peru. Unlike in the US, workers in Peru, get long lunch break in between their working hours, which even extend up to three hours, giving scope to the workers to take a siesta. They, however, start early morning to maintain the schedule of actual working hours.

### Management Is an Emerging Profession

The word profession has variety of meanings. It is characterized as an occupation based on specialized knowledge and skill, a theoretical structure, learning of science. Management as an occupation fits the above characteristics. On the other hand, management lacks the characteristic of a true profession because it does not fulfil certain characteristics of a profession. In order to be a profession in a true sense, management has to satisfy following important characteristics: (i) existence of an organized and systematized body of knowledge, (ii) formal method of acquisition of knowledge, (iii) existence of an association with professionalism as its goals, (iv) formulation of ethical codes and (v) service motives. Many authors argue that management does not satisfy all these characteristics; hence, it is wrong to designate management as a profession. It is better to call management as an emerging profession. Whatever may be the arguments, management is increasingly getting recognized in India as a profession. To substantiate the claim, there are a number of professional management bodies like All India Management Association, National Institute of Personnel Management, Indian Society for Training and Development, etc., who are furthering the cause of management by regular membership services. They came out with the professional ethics, which largely focus on service motives, taking profession beyond one's individual livelihood.

### Management Is a Strategic Function

Every organization now has to move strategically to chart their action plan to sustain their competitive edge in a changing environment. Whether to emphasize new market development or enhance scope for repeat buying with better customer relationship management (CRM), it is a strategic choice which an organization has to make. This aspect has been discussed in our chapter on Planning.

### Importance of Management

All the aforementioned points contribute to the significance of management in an organization. However, in order to give a better presentation, some points have been listed in the following, which a reader can elaborate based on the earlier inputs:

1. Management optimizes use of scarce resources
2. Management ensures effective leadership and motivation
3. Management promotes industrial relations harmony
4. Management helps in achieving goals
5. Management facilitates change and growth
6. Management enhances quality of life
7. Management improves productivity

8. Management contributes to organizational competitiveness
9. Management develops professionalism
10. Management contributes to organizational growth.

### MANAGEMENT—SCIENCE OR ART

Science is defined as a body of knowledge systematized through application of scientific method in any department of enquiry. Thus, chemistry as a science refers to a systematic body of knowledge accumulated through application of scientific methods in this area. Science is systematic in the sense that certain scientific methods in this area. Science is systematic in the sense that certain relationships, principles and their limitations have been discovered, tested and established. However, it does not mean that the principles and laws so established are immutable. Discovery of new knowledge and phenomena can always change any principle irrespective of its standing and respect. Management can be described as a science but not in the sense physical sciences are. Management is a theory possessing a number of principles relating to coordination, organization, decision making and so on. It is true that we cannot have the same kind of experimentation in management as is possible in natural sciences. However, same is the case with economics, political science, military science and a number of other sciences dealing with the complex structure of group norms and behaviour. Thus, it is appropriate to emphasize that management is still a growing science.

The function of art is to effect change or accomplish goals by deliberate efforts. Art is reflected from the practical application of theoretical knowledge. In this sense, management is an art as well. Management principles are important not for the sake of knowledge alone but also for their application in concrete situations. In fact, skill in application of principles to work situations is so important to the job of an executive that some authorities regard management to be essentially an art. However, it would not be appropriate to regard science and art as mutually exclusive. The fact is that science is theoretical, whereas, art is practical, and both are complementary to each other. Thus, theory and practice of management are mutually helpful.

### MANAGEMENT AS A PROFESSION

Corporate form of organization with separation of ownership from management, growing complexities in managing the activities of organization, development of organized body of systematic knowledge of management are essential factors which are responsible for raising management to the status of a distinct profession. A field is normally characterized as profession when the following special features are present in it:

- (i) Systematic body of knowledge
- (ii) Need for learning and proper organization
- (iii) Entry restricted on the basis of examination or education
- (iv) Dominance of service motive over profit motive

Except for restricted entry, management qualifies all other tests of a profession. It is now backed by a systematic body of knowledge. A number of management principles have been developed which need proper learning and education. Besides, in a number of countries management institutes, associations and universities are now imparting knowledge relating to management. Moreover, social and moral

climate has created new challenges for the management. Management of today must be creative rather than adaptive and must also be conscious of its ethical and social responsibilities to the society. Another important development in the field of management has been that professional management consultants are growing both in numbers and quality. However, management fails to qualify the test of professionalism that is related to restricted entry. Though there is growing preference in the society for properly educated and trained people for managing business enterprises, yet self-made managers cannot altogether be eliminated. Thus, management may not be a profession strictly similar to the legal or medical, yet professional overtones are very much present in management.

As mentioned in our introductory literature, management was influenced by various disciplines like, sociology, economics, political science, anthropology, psychology and even by literatures. Due to such multi-disciplinary approaches, authors like Harold Koontz referred it as 'jungle'. Even, there exist differences in classification of approaches. However, probably the best way to classify management approaches from the analysis of Hutchinson (1971), which considers the process of development of management from five different perspectives. Without going into the details of such differences in approaches, we have analysed the history of management from three different perspectives as following:

1. Classical Approach
2. Neo-classical Approach
3. Modern Approach

Classical approach conventionally is considered as traditionally accepted views and not views which are classical due to being time-bound. Classical management approach emphasizes the concept of organizational efficiency to increase organizational success. It believes in functional interrelationship, following of certain principles based on experience, bureaucratic structure and reward-punishment nexus. Classical thoughts on management developed in three different directions—bureaucracy, scientific management and administration theory. Bureaucratic Approach was pioneered by Max Weber (1920), Scientific Management Approach was pioneered by F.W. Taylor (1930) and Administration Theory concept was pioneered by Henri Fayol (1925).

Neo-classical theory emphasizes human relations, importance of man behind the machine, the importance of individual as well as group relationships, social aspects, etc. This approach was pioneered by Elton Mayo and his associates in 1930. It further got extended to behavioural sciences approach, pioneered by Abraham Maslow, Chris Argyris, Douglas McGregor and Rensis Likert. Quantitative Approach (during World War II) and Contingency (situational) Approach also form the part of the neo-classical theory.

Modern management thought combines concepts of classical approach with social and natural sciences. Basically, it emerged from systems analysis.

### PRE-CLASSICAL APPROACH

Even though most of the discussions on evolution of management thoughts start with the classical approach, we have here briefly discussed the contributions of some of the theorists, who belong to the pre-classical school of thought, to appreciate the process of development in management thoughts.

Contributors	Pioneering Ideas
Robert Owen (1771-1858)	He is considered as pioneer in Human Resource Management process. He had advocated the necessity for concern for welfare of workers.
Charles Babbage (1792-1871)	As an inventor and management scientist, he had built the practical mechanical calculator, which we consider as the basis of modern computer. Further, he had also advocated the idea of specialization of mental work and suggested the necessity of profit sharing.
Andrew Ure (1778-1857) and Charles Duplin (1784-1873)	They had emphasized the necessity of management education, which further paved the way to professionalize the management functions.
Henry Robinson Towne (1844-1924)	Emphasized the significance of business skills in running a business.

Reviewing the contributions of pre-classical theorists, it is clear that their emphasis was more on developing some specific techniques to solve some identified problems. Due to their obvious technical background, they could not think of management as a separate field. By and large, they had integrated management with their respective areas of specialization. Andrew Ure, Charles Duplin and Henry Robinson Towne laid the foundation of management theory, which ultimately shaped the management thoughts, as we can see today.

### CLASSICAL SCHOOL OF THOUGHT

This school of thought is actually divided into two different approaches—scientific school and administrative school. These theorists laid down the foundations of managing an organization following certain principles. In the table below, we have explained the essence of their principles, highlighting the contributions in a nutshell.

Scientific Management	
Frederick W. Taylor (1856-1915)	Development of Scientific Management
Frank B. Gilbreth (1868-1924) and Lillian M. Gilbreth (1878-1972)	Time and Motion Studies
Henry L. Gantt (1861-1919)	The Gantt Chart
Administrative Theory	
Henri Fayol (1841-1925)	General Theory of Management
Max Weber (1864-1920)	Rules

### Scientific Management Approach

This is the most pioneering classical approach, which lays emphasis on the scientific study of work methods to improve efficiency of the workers. Among all the contributors to this school of thought, the contribution of **F.W. Taylor** is considered the most important one. F.W. Taylor, by developing specific principles of scientific management, in 1911 became the father of scientific management. He had started his experiments with the concept in 1878 at Midvale Steel Co. During his days at Midvale he saw that employees were 'soldiering', which means deliberately working at a pace slower than their capabilities. He identified that workers indulged in 'soldiering' primarily for three reasons as under:

- Fear of losing jobs if they increase their output
- Faulty wage systems
- Outdated methods of working

For eliminating this problem, Taylor developed the principles of scientific management, emphasizing mainly on five important issues:

1.	Attain organized knowledge rather than relying on rule of thumb
2.	Obtain harmony in group action
3.	Achieve cooperation
4.	Work for maximum output rather than restricted output
5.	Develop all workers both for their self-development and organizational prosperity

In essence, Taylor emphasized the following points to achieve organizational efficiency:

- Develop scientific way of performing jobs
- Train and develop workers to perform the job
- Establish harmonious relations between management and workers

In order to ensure that such objectives are achieved, Taylor suggested two important managerial practices like, *piece-rate incentive system* and *time and motion study*. Piece rate incentive system rewards the worker who produces the maximum output. Existence of such incentive system obviously will motivate workers to work more to maximize their earnings. This system requires workers to perform at some pre decided standard rate to earn their base wages. Standards are decided using time and motion study. If workers are able to produce more, then in addition to their base rate, they get incentives on the number of excess units produced over and above the standard units. This serves both the interest of workers and management, as workers feel motivated to maximize their earnings, while management gets the benefit of increased productivity.

*Time and motion study*, as already pointed out, facilitates determination of standard time for performing a job. Time study helps in the determination of time required, duly defining the art of recording, analysing and synthesizing the time elements of each operation. Motion study, on other hand, involves study of movements in doing a job, in parts and eliminates wasteful movements and retains only necessary movements. In other way, it makes a job simple, easier and better.

In fact, time and motion study concepts were developed by **F.W. Taylor** in association with **Frank and Lillian Gilberth**. Like Taylor, Frank Gilberth is known as the father of motion study. Lillian Gilberth, on the other hand, conducted the research on motion studies. Both of them explored the ways of reducing the fatigue. They had classified seventeen basic hand motions like search, select, position, hold, etc., which they called *therbligs* (spelling backward with 't' and 'h' transposed). Their approach helps us to analyse the exact elements of a worker's hand movements. A simple modification of brick laying approach, following Gilberth's approach, helped to increase hourly output from 120 to 350 bricks.

**Henry Laurence Gantt** also worked as a close associate of F.W. Taylor at Midvale and subsequently at Bethlehem Steel. His contributions to the scientific management school of thought are introduction of task and bonus system and a management chart commonly known as Gantt chart. As per his incentive plan, workers receive their day wages even when they do not perform their complete job. But they get bonus, when they complete the work in better than the normal standard time. They also recommended payment of bonus to foremen, based on the incremental performance of workers.

*Gantt chart*, on the other hand, is used for production planning to compare the actual and planned performances. It is a visual device for production control, indicating progress of production in terms of time rather than quantity. In fact, Programme Evaluation and Review Technique (PERT) concept subsequently was developed based on the Gantt chart. In our chapter on Control, Gantt chart has been illustrated.

#### Drawbacks of Scientific Management School of Thought

- Basic scientific management principles revolve around the operational level problems and do not focus on managerial issues essential for managing an organization. That is why it is often said that scientific management approach is more about engineering than management.
- While framing the principles, assumptions about workers only consider that they are rational and primarily driven for their desire to fulfil material gains. Therefore, economic and physical needs of the people were only emphasized and not their social needs.
- This theory also ignores the human desire for job satisfaction.

#### Administrative Theory

Administrative theory, another part of classical school of thought, focuses on principles to coordinate the internal activities of the organization. Henri Fayol, the French industrialist, through his pioneering work on 'General and Industrial Management' explained that satisfactory results can be achieved with scientific forecasting and proper methods of management. Fayol at the outset, classified business operation of an organization into six activities and then outlined fourteen principles of management. Six activities are as follows:

- Technical** — Activities concerned with production and manufacturing
- Commercial** — Activities related to buying, selling and exchange
- Financial** — Activities ensuring that ensure optimal use of capital

- Security** — Activities that ensure protection employees and property
- Accounting** — Activities concerned with costs, profits and liabilities, maintaining balance sheets and compiling statistics
- Managerial** — It is a functional approach to management, i.e., concerned with planning, organizing, commanding, coordinating and controlling

After detailing out all these activities, Fayol primarily focused on the managerial activities and outlined fourteen principles to achieve efficiency in managerial activities. His fourteen principles are as under:

(i) <b>Division of Labour</b>	If people are specialized, they can perform their tasks better. It recommends grouping of people as per their area of specialization. Modern assembly line concept is an outcome of division of labour.
(ii) <b>Authority</b>	Managers must have authority to get things done. However, formal authority alone may not help to compel obedience from the subordinates; managers must have expertise to exert personal authority.
(iii) <b>Discipline</b>	People working in an organization need to comply with rules and agreements that govern the organization. Without discipline, results cannot be achieved. Good discipline results to good leadership, and these together can create an environment of good work culture.
(iv) <b>Unity of Command</b>	Members in an organization must receive instructions from only one person. Conflict will arise when one receives orders and instructions from multiple bosses. Therefore, ideally reporting relationship of one subordinate should be with one superior. This type of command is known as scalar chain. Its literal meaning is a straight chain of command that extends unbroken from the ultimate officer to the lowest ranks.
(v) <b>Unity of Direction</b>	All operations of an organization need to be directed to one objective. Without this, achievement of goals cannot be ensured.
(vi) <b>Subordination of Individual Interest to the Common Good</b>	Interest of an individual employee should not take precedence over the interests of the organization as a whole.
(vii) <b>Remuneration</b>	It should be fair to both employees and employers.
(viii) <b>Centralization</b>	Centralization reduces the role of the subordinates in decision making, decentralization enhances it. Managers should retain responsibility by centralization but at the same time give their subordinates enough authority to do their jobs properly.

(Continued)

(ix) The Hierarchy	There should be a line of authority, illustrated in the form of an organization chart, showing clearly from the top management to down the line.
(x) Order	People and materials should be in the right place at the right time. Job allocation to people should be made in a way that suits them.
(xi) Equity	Managers should be fair to their subordinates.
(xii) Stability of Staff	Employee turnover should be less to ensure efficiency of an organization.
(xiii) Initiative	Subordinates should have the freedom to conceive and do their task, even though they may commit mistakes.
(xiv) Esprit de Corps	Team spirit should be promoted to develop a culture of unity in an organization. Use of verbal communication instead of formal written communication wherever possible may help in developing team spirit in organization.

### Bureaucratic Theory

This theory was pioneered by Max Weber, which lays emphasis on the authority structures and description of an organization based on the authority relations. As per Weber a bureaucracy is 'highly structured, formalized and impersonal organization.' In fact, he has advocated the necessity of a formal organizational structure with set rules and regulations. Characteristics of a bureaucratic organization have been described by Weber as under:

Characteristics	Description
Specialization of Labour	Jobs are broken down into routine, well-defined tasks so that members of the organization know what is expected from them and what can become competent enough to do a particular subset of tasks.
Formal rules and procedures	Written rules and procedures should specify the desired behaviours from members of the organization and facilitate coordination and ensure uniformity.
Impersonality	Rules, procedures and sanctions should be applied uniformly regardless of individuals.
Well-defined hierarchy	Multiple levels of positions must be designed carefully keeping in mind the reporting relationships among levels. This should provide for supervision, handling of situation of exceptions and ability to establish accountability of actions.
Career advancement based on merit	Selection and promotions should be based on the qualifications and performance of members.

Bureaucracy is often misunderstood as red tapism and too many rules. However, Weber's concept is intended to remove ambiguity, inefficiencies and patronage.

### Limitations of Classical School of Thought

Behavioural theorists criticized the classical theorists on number of grounds. First of all management principles are not universally applicable in today's complex business situation. Some principles of Fayol are also contradictory, viz., principle of specialization contradicts principle of unity of command. Similarly, Weber's bureaucracy also takes away individual's creativity and flexibility, which dissuade them to respond to a complex situation in a global environment. Further, classical theorists also ignored the important aspects of organizational behaviour. These theories do not deal with the problems of leadership, motivation, power or informal relations. Also, these theories fail to consider the influence of internal and external environmental forces affecting an organization. Theories only stress upon the necessity of achieving productivity, more than anything else.

### NEO-CLASSICAL SCHOOL OF THOUGHT

The neo-classical approach is discussed as follows:

#### Behavioural Theories

This school of management lays emphasis on the human element in an organization, duly recognizing its importance. It puts more stress on individual attitudes and behaviours and on group processes. Major contributors to this school of thought are in the following:

Mary Parker Follett (1868-1933)	Group influences
Elton Mayo (1880-1949)	Effect of human motivation on productivity and output
Abraham Maslow (1908-1970)	Relates human motivation to hierarchy of needs
Douglas McGregor (1906-1964)	Puts emphasis on human characteristics—Theory X and Theory Y and the corresponding style of leadership
Chris Argyris (1923-)	Human and Organizational Development—Model I and Model II

Mary Parker Follett is known to be the pioneer in behavioural approach to management. She recognized the significance of the human element, attributed greater significance to the functioning of the groups in workplace. As per Follett, critical role of managers should be to bring constructive change in organization, following the principle of 'power with' rather than 'power over'. She opined that power should not be based of hierarchical level but should be collectively developed, fostering a cooperative concept, involving superiors and subordinates and finally working together as a team. Hence, the focus is more on power sharing. Organizations

need to become democratic to accommodate employees and managers. People will work harder when an organization recognizes individual's motivating desires.

Even though Follett was the pioneer in behavioural approach to management, it is **Elton Mayo**, who is recognized as the father of the *Human Relations Approach*. Mayo and his associates conducted the study at Western Electric's Hawthorne Plant between 1927 and 1932 to evaluate the attitudes and psychological reactions of workers in on-the-job situations. Their experiments were carried out in following four phases:

1. Illumination experiments
2. Relay assembly test room experiments
3. Interview phase
4. Bank wiring observation room experiment

### ***Illumination Experiments***

These experiments took place, initially between 1924 and 1927, in Hawthorne Plant of Western Electric Company, involving industrial engineers of Western Electric Company. The experiments involved manipulation of illumination for one group of workers (test group) and comparison of their performance and productivity with another group, for whom the illumination was not manipulated (control group). In the first spell of experiment, for the test group (for whom the illumination was manipulated), performance and productivity improved. However, this did not last long. In fact, control group's performance also rose in between with the alteration of lighting conditions of the test group, even though for the control group there was no change in the light conditions. With such contradicting results, researchers concluded that intensity of illumination was not related to productivity of workers. There must be something besides illumination, which might have influenced the performance of workers in Western Electric Company. Elton Mayo and his associates from Harvard University were involved at this point to conduct the subsequent phases of experiments.

### ***Relay Assembly Test Room Experiments***

These set of experiments were conducted under the guidance of Elton Mayo between 1927 and 1933. At this stage also researchers were concerned about other working conditions, like working hours, working conditions, refreshments, temperatures, etc. To start with the researchers selected six women employees of the relay assembly test room. Their jobs were to assemble relay (a small device) using thirty-five spare parts. Selected women employees (samples) were put in a separate room and briefed about the experiments. In the test room, the number of variables was altered, like increased wages and rest period, shortened workday and workweek, etc. In addition, the sample workers were also given the freedom to leave their workstation without permission and were also given special attention. Productivity increased over the study period. Such results, therefore, led the researchers to believe that better treatment of subordinates made them more productive. They highlighted the significance of social relations. Finally, researchers were convinced that workers would perform better if management look after their welfare and supervisors pay special attention to them. Such syndrome was later labelled as the 'Hawthorne Effect.'

### ***Interview Phase***

In this phase of experiments, about 21,000 people were interviewed over three years between 1928 and 1930. The purpose of the interview was to explore attitudes of the workers in depth. Results of the interview are as follows:

- (a) A complaint may not necessarily be an objective recital of facts, it also reflects personal disturbance, which may be for some deep-rooted cause.
- (b) All objects, persons and events carry some social meanings. They relate to employees' satisfaction or dissatisfaction.
- (c) Workers' personal situations are results of configuration of relationships, involving sentiments, desires and interests. Such relational variables, when related to workers' own past and present interpersonal relations, result to their personal situations.
- (d) Workers assign meaning to their status in organization and give value to the events, objects, their specific feature of environment (like hours of work, wages, etc.).
- (e) Workers derive satisfaction or dissatisfaction from the social status of an organization. It means that they also look for social rewards, associating them with an organization.
- (f) Workers social demands are influenced by social experiences in groups, both inside and outside the workplace.

### ***Bank Wiring Observation Room Experiment***

This part of the Hawthorne Experiment was conducted to test some of the ideas that researchers could form during the interview phase. It was conducted between 1931 and 1932. In this experiment there were fourteen participants (samples), including wiremen, soldermen and inspectors. At this phase of experiment, there was no change in the physical working conditions. Sample workers were paid based on the incentive pay plan, relating their pay to output. Sample workers had the opportunity to earn more by increasing the output. However, researchers observed that output was constant at a certain level. Analysis of the results showed that the group was encouraged neither too much nor too little work. They on their own enforce 'a fair day's work.' Group norms, therefore, are more important to worker than money. The study thus provided some insights into the informal social relations within groups.

The Hawthorne Experiments, therefore, focused on the importance of human relations and thus contributed immensely to management theory.

### ***Criticisms of Hawthorne Experiments***

Despite its brilliant contributions to the theories of management, it was criticized on following grounds:

- (i) It is believed procedures and analysis of the findings and conclusions drawn thereon have little relevance. In fact, conclusions are not supported by adequate evidence.
- (ii) The relationship between satisfaction and happiness of workers with productivity were established with simplistic assumptions, while in reality, the situation is more complex due to behavioural phenomena.

- (iii) Further all these studies failed to focus on attitudes of workers, though attitudes play a crucial role in influencing workers performance and productivity.

In the behavioural school of thoughts, other contributors like **Abraham Maslow**, **Douglas McGregor**, **Chris Argyris** also had made significant impact. While Maslow's focus was on the importance of human needs—major driving force for human motivation, McGregor had made certain assumptions about people, categorizing them under Theory X and Theory Y. Theory X essentially represents negative view's about people, i.e., people are, by nature, lazy, have little ambitions, dislike work, avoid responsibility and require direction to work. Theory Y, on the contrary, assumes people are more positive, capable of self-control, innovative and creative, do not inherently dislike work. The theories have not been discussed in details. They have been covered in the theories of motivation.

**Chris Argyris's** contributions to the behavioural school of thoughts are extremely important. His contributions are maturity-immaturity theory, integration of individual and organizational goals and pattern of Model-I and Model-II. According to maturity-immaturity theory, people progress from a stage of immaturity and dependence to a state of maturity and independence. If organizations keep their employees in a dependent state, they allow them to remain immature and thereby prevent them from achieving their potential. Further, he had also contended that formal organization develops a rigid structure, compelling people to behave in an immature way. This leads to incongruence between the individual and organizational goals, hinders organizational development and results to failure and foster frustration and conflict. People, therefore, show their aggression, regression and suppression. Model-I and Model-II pattern are two different assumptions. Workers in Model-I type of organization are motivated by the desire to manipulate others and protect themselves from others. Workers in Model-II type of organization are less manipulative and are more willing to learn and take risks. Argyris, therefore, suggested that managers should always try to create a Model-II type of organization.

**Rensis Likert** (1903–1972) and **Peter F. Drucker** had also contributed significantly to this school of thought. Likert had attributed low productivity and poor morale of employees to the typical job-centred supervision technique. He had suggested some leadership styles to ensure better productivity and improved morale of workers. These we have discussed in our chapter on leadership. Peter F. Drucker, on the other hand, had pioneered several modern management concepts in the fields of innovation, creativity, problem solving, organization design, MBO, etc. All his principles have been acknowledged in different chapters of this book.

### MODERN APPROACHES

Some modern approaches also played a significant role in the evolution of management theories. These approaches can be classified as Quantitative School of Thought, the Systems Theory and the Contingency Theory.

#### Quantitative School of Thought

Quantitative school of thought emerged during the World War II. During the war, managers, government officials and the scientists were brought together to help the

army to effectively utilize resources. Using earlier mathematical approaches to the concepts advocated by F.W. Taylor and Gantt, the experts of quantitative school of thought, solved many logistic problems in the war. After the war, such techniques were applied by many organizations to solve their business problems. This school of thought extensively utilized statistics, optimization models, information models and computer simulations for decision making and economic effectiveness to solve business problems. Different branches of quantitative approach are:

- Management science
- Operations management
- Management information system

**Management Science Approach** visualizes management as a logical entity, expressing management in terms of mathematical symbols, relationships and measurement data. This approach is also known as operations research approach. In areas like capital budgeting and cash flow management, production scheduling, development of product strategies, human resource planning, inventory management, etc., such approach is used. Various mathematical tools like queuing theory, linear programming, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), decision theory, simulation, replacement, probability theory and sampling, time series analysis, index numbers, etc., are used to minimize the error in management decisions. Due to its importance, all these mathematical tools are taught in modern management education programmes to develop managerial skills.

**Operations Management** is another approach under this school of thought. This approach is primarily concerned with the production management and its related areas. In fact, it is difficult to draw a line between management science and operations management. In operations management, most of the mathematical tools that are mentioned in the discussion of management science are used. Moreover, such approach also helps in decision making in other functional areas like finance, marketing, human resource management, etc.

**Management Information Systems (MIS)** approach focuses on design and implementation of computer-based information systems for the management's use. It converts raw data into information inputs, which are subsequently used by management for any decision making. Now-a-days, MIS helps in enterprise-wide decision making, integrating all functions of management. Enterprise-wide decision support systems like Human Resource Information Systems (HRIS) is an important example, which is used for any critical or strategically important decisions, as it provides valuable information inputs.

#### Systems Theory Approach

An extension of quantitative school of thought is **Systems Theory Approach**. This approach considers organization as a whole because of the interdependent nature of activities, requiring organization to interact with the external environmental factors. In this competitive scenario, organizations cannot function in isolation. It has to operate in an open system, interacting with the environment around it. Whether it is a new product development or employee selection, organization has to decide considering it as an open system, as its decisions are interrelated and interdependent on the environmental situation. Synergy is the phenomenon of

open systems of management by which the total system is more than a simple sum of its parts. It means, if a manager effectively coordinates the efforts of related sub-systems, the result would be greater than the sum total of such independent efforts, i.e.,  $2 + 2$  would be greater than 4. Systems Approach to management is also important because it helps in avoiding entropy. Entropy is a syndrome, where systems and processes eventually decay. By relating organization to environment, following the Systems Approach, such situation can be averted

### Contingency Theory Approach

*Contingency Theory Approach* is another extension of modern approach. It also contributed significantly to the evolution of management thoughts. This approach discards the concept of universality in management principles and determines managerial decisions considering situational factors. The task of a manager, as per this theory, is to identify which technique will, in a particular situation, under particular circumstances and at a particular point of time, best contribute to achievement of organizational goals. The theory contends that organizational phenomena exist in a logical pattern, which managers can understand by gradually interpreting various situations. They can thereby frame their managerial styles, which vary from situation to situation.

Contingency Theory and Systems Theory together are classified as *Integrative School of Management Thought*, because these two theories integrate the classical, behavioural and quantitative theories into a framework that uses only the best of each approach in a given situation.

### CONTEMPORARY SCHOOL OF MANAGEMENT THOUGHTS

This school of management thought provides a framework of management practices, based on more recent trends like globalization, Theory Z Concepts, McKinsey's 7-S Framework, excellence models, productivity and quality issues, etc.

With World Trade Organization (WTO) and European Economic Community (EEC), we now operate in a global economy. Our managers are now required to think globally even to operate in a domestic market. Many indigenous companies are losing their domestic market shares due to the competition from the foreign companies. Hence, understanding management with a global perspective has now become very important.

**Theory Z Concepts**, pioneered by Ouchi and Jaeger (1978) incorporate Japanese and American management culture and emphasize the need for studying and adopting appropriate management practices from other countries. The concept can be understood from the following tabular information.

Type A (American)	Type J (Japanese)	Type Z (Modified American)
Short-term employment	Lifetime employment	Long-term employment
Individual decision making	Consensual decision making	Consensual decision making

(Continued)

Type A (American)	Type J (Japanese)	Type Z (Modified American)
Individual responsibility	Collective responsibility	Individual responsibility
Rapid evaluation and promotion	Slow evaluation and promotion	Slow evaluation and promotion
Explicit, formalized control	Implicit, informal control	Implicit, informal control with explicit, formalized measures
Specialized career path	Non-specialized career path	Moderately specialized career path
Segmented concern	Holistic concern	Holistic concern, including family

**McKinsey's 7-S Framework** identified seven independent organizational factors that are needed to be managed by today's managers.

- Strategy to determine allocation of scarce resource and commit organization to specific course of action
- Structure to determine number of levels (in hierarchy) and authority centers
- Systems to determine organizational process, procedures, reports and routines
- Staff to determine key human resource groups in organization and describe them demographically
- Style to determine the manner in which managers should behave in achieving organizational goals
- Superordinate goals (shared vision) to determine the guiding concepts that an organization has to instil in its members
- Skill to determine the abilities of people in an organization

7-S Framework suggests that any change in any S factor may result to the adjustment of other S factors. Now, however, the concept of 8-S has been introduced, which add one more S to McKinsey's 7-S Framework, i.e., Streaming. Streaming includes those areas which either indirectly or directly influence or shape the other Ss.

Peters and Waterman (1982) in their pioneering work, *In search of Excellence* identified some common characteristics of excellent organizations. Such characteristics have now become important management principles.

- A Bias for Action — Excellent firms make things happen
- Closeness to the Customer — These firms know their customers and their needs
- Autonomy and Entrepreneurship — They value these qualities in each employee
- Productivity — They trust employees to achieve this

- Hands-on, Value-Driven Management — They make it mandatory
- Stick to the knitting — They always deal from strength
- Simple Form of Lean Staff — They develop cost effective work teams.
- Simultaneous Loose-Tight Properties — They decentralize many decisions, retaining, however, tight control

Global competition has also accentuated the need for enhancing quality and productivity. These two are the basic requirements to retain the competitive advantage for any organization. Hence, management practices should focus on these by developing human resources to sustain their competitive advantage.

### MANAGERIAL ROLES

Managerial role is a position specific behavioural pattern of managers. Henry Mintzberg (1973) based on his study of five organizations, identified ten different roles of managers, classifying it first to three broad roles like interpersonal, informational and decisional. Interpersonal roles are classified into figurehead, leader and liaison roles; informational roles are classified into monitor, disseminator, and spokesperson roles; and decisional roles are classified into entrepreneur, disturbance handler, resource allocator and negotiator roles. In Table-1, these managerial roles have been elaborated.

**Mintzberg's Managerial Roles**

Role Category	Role Type	Role Nature
Interpersonal	Figure Head	Representing organization to perform ceremonial duties
	Leader	Influencing subordinates to achieving their goals and objectives
	Liaison	Maintaining horizontal chain of communication
Informational	Monitor	Collecting information concerning organization and shortlisting relevant information
	Disseminator	Sharing relevant information with subordinates
	Spokesperson	Maintaining protocol to share information with outsiders
Decisional	Entrepreneur	Focusing on innovation and change with the organization
	Disturbance handler	Managing conflicting situation by taking corrective action
	Resource allocator	Optimizing resource allocation to different competing needs within the organization
	Negotiator	Representing organization in all major negotiation

### MANAGERIAL SKILLS AND COMPETENCIES

Skills of managers have now become an important factor to address global competitiveness both at organizational and national level. However, because of the problem of quantification of benefits, imparting skills through training and development is yet not recognized as an important initiative at organizational level for problem of quantification of benefits. Skill is defined as a coordinated series of actions that serves to attain some goal or accomplish a particular task. Operationally, skills are defined widely as overt responses and controlled stimulation. Overt responses may be verbal, motor or perceptual. Verbal response typically stresses on speaking (which requires memorization of words); motor response stresses on movements of limbs and body, whereas, perceptual responses stress on understanding of sensory response. Controlled stimulation, on the other hand, are energy inputs to the workers, which we express in units of frequency, length, time and weight. Technological change and skill requirements have been made a subject of investigation in enormous studies across the world. There is a general consensus that a technological change alters the job but the observations differ in its nature and form. The Neo-Classical Economic Theory advocated technological changes that require broader variety of skills and higher than average skills from the workers. New forms of skill and responsibility along with technological changes have been studied in Continuous Process Industry and Chemical Manufacturing Units, Petroleum Refining, Metal Working Industries, Banking Operations and in many other industries. Another school of thought advocates that technology is instrumental in fractionating and de-skilling of jobs. Redesigning of jobs subsequent to technological change separates the planning and the concept of job in its totality from the execution aspect of work. De-skilling and skill downgrading also occur due to differential growth of higher- versus low-skill occupations and industries. The focal point of this hypothesis is that the technology induces differential point of growth for different sectors of the economy and produces skill polarization by eventual occupational shift to skilled jobs in some industries and unskilled jobs in many others. These phenomena are especially evident in India. From the 1981 Census Reports onwards, we find a major occupational shift of workers from primary sector to secondary sector and from secondary sector to tertiary sector. Simultaneous structural change in occupational pattern is also evident, as the number of blue-collar workers has been drastically reduced while the number of white-collar workers has significantly increased. Another school of thought argues de-skilling is a secondary consequence of de-industrialization, which again is prompted by the technological change. The other approach, i.e., the mixed change or conditional position, is more of a characterization of the empirical evidence than a well-developed theory.

Transformations in skill due to technological change occur along two tracks— (i) compositional shift, i.e., structural change in occupational pattern due to creation or elimination of jobs of a given skill level and the distribution of persons to jobs in sectoral economy and (ii) changes in work content (the technical nature of work and the role relations surrounding the work performance).

Internationally, the careers of the future will require greater education (more in the form of institutionalized knowledge) at the job entry level and will also demand for continuing education to keep pace with the technological dynamism. In future,

a greater level of technological literacy, will be in demand even for occupations that require low skills and are low paying in nature.

Tracing back history, we find that the Indian social system had definite orientation towards developing and maintaining different social groups in terms of certain crafts. The quality elements in a particular craft and the necessary skills were the deciding factors for the purpose of ranking that craft along with others in order of importance.

There was a time when carpenters, goldsmiths and weavers were the craftsmen in India who enjoyed the highest status. However, it is pertinent to mention that Indian psycho-philosophy attaches more importance to values than formal occupational skills. It is, therefore, the value-laden skills, on which actually Indian psycho-philosophy gives importance than skills, per se.

From the above perspective, we can therefore, categorize skill either as generic or technical: entry level or advanced. Conventionally, skill can be defined as those knowledge or attributes, which are deemed vital to organizational success. There are four general types of skills:

- ✓ **Technical** — which relates to specific concepts, methods and tools that are specific to an organization
- ✓ **Supervisory** — which enables one to effectively supervise others
- ✓ **Interpersonal** — which enables people to communicate and interact effectively
- ✓ **General Business** — lines of business and support infrastructure

Technical skills are observable, demonstrable and testable. The other skill types are softer, more subjective and difficult to quantify.

Any organization going for skill renewal or skill-change exercise, needs to undertake following tasks:

- Profile the skills required by jobs
- Assess the skill levels acquired by individuals
- Conduct a gap analysis between required and acquired skills

Training should ideally occur before the skill is needed so that the day-to-day work performance can be reinforced through training.

### ✓ Skills Inventories

A skills inventory is a device for locating information about individuals and their suitability for different jobs. Skills inventories include the name of a prospective employee and a listing (or 'inventory') of job-related skills, training and/or experience, which could prove useful in a future assignment. The purpose of skills inventories is to provide the organization with *quick, accurate information on all employees in order that management can choose the best qualified person for promotion or transfer*. For example, a skills inventory may consist of the following information: age, address, health, education, willingness to travel, experience in past and present jobs and foreign languages spoken by the candidate. If an overseas assignment requiring the speaking of German should suddenly become vacant, the skills inventory could quickly identify those candidates who possess the needed qualifications for such an assignment.

## Multi-Skilling

Multi-skilling is defined as the process to train employees in specific skills that cross the traditional trade-specific or craft-specific skill sets. Thus to develop multi-skills, employees require additional training to enable them to perform more jobs within the same job family or to do the entire jobs from a holistic point of view. It is generally believed that multi-skilling of employees often done keeping downsizing in mind. However, downsizing occurs for skill obsolescence, among other reasons, while multi-skilling is needed for a holistic development of human potentialities to effectively address the requirements of changing production process (more flexible and customized), organizational systems (decentralized control) and state-of-art technology (numeric control, computer numeric control, direct numeric control, etc.). Multi-skilling facilitates intra-occupational and inter-occupational job mobility and thereby reinforces human resource planning (HRP).

## Competencies

Competencies are a set of behaviours, which encompass skills, knowledge, abilities and attributes. Competencies are needed to be assessed both at the organizational level and at individual level. Individual competencies of an employee reinforce the organizational competencies of the employee. However, there always exists a possibility of major incongruence between individual competencies and organizational competencies. Manpower planning exercise helps us to analyse such gap and develop a competency model. A competency model is a map to display a set of competencies. It is future oriented and helps to describe an ideal workforce. A competency model, when developed and documented, helps in managerial decision making, as it is well aligned with vision, mission, objectives, goals and strategies of an organization. It also helps employees of an organization to understand the functional requirements and self-initiate the enrichment of their skills, knowledge, abilities and attributes. This would be independent of organization-wide competency enrichment exercise.

## MANAGEMENT BY OBJECTIVES (MBO)

Peter F. Drucker (1954) for the first time emphasized the organizational needs for setting objectives to make performance more measurable. (When objectives are set in a systematic manner, consciously directing towards effective and efficient achievement of organizational and individual targets, we call it MBO.) It was General Electric Company, which used the elements of MBO while reorganizing the organization, introducing decentralized decision making. For most of the organization, MBO is required for performance appraisal, as it calls for active involvement of subordinates in setting the objective standards, which exert enhanced degree of commitment from them to achieve the results. Likewise, MBO also acts as a motivating factor for the employees because they can understand their specific objectives and can assess on their own the degree of their achievement. Thus, MBO improves the way of managing an organization with clarity, personal commitment and developed effective controls. In fact, MBO paved the way for participative management, involving people in framing objectives, aligning their individual goals with the organizational goals or vice-versa.

**SUMMARY**

In this introductory chapter, we have defined management from different perspectives, mentioned its nature, process, functions and importance. We have also examined management from historical perspective, its process of development and various schools of thoughts. Basic functions of management have been discussed briefly as all these functions have been separately covered in our subsequent chapters. Two important arguments, i.e., management as a profession and management science or an art have been discussed. While discussing the importance of management, we have also examined contemporary focus of management on areas like strategy, social responsibility, management as a social process/social responsibility of management, universality of management, etc. This being an introductory chapter that has set the pace of the whole book, it is recommended to readers to understand the concepts clearly and carefully, rather than memorizing the contents without understanding them properly. Understanding of the basics at this stage will help the readers to understand the subsequent chapters better and develop complete knowledge about management.

**Key Words**

**Process Orientation:** Views management as a process.

**Productivity Orientation:** Views management as a means to enhance productivity.

**Decision-Making Orientation:** Considers decision making as the primary function of management.

**Management by Objective:** Requires management of an organization to focus primarily on objectives and then manage the whole organization with the directions set by the objectives.

**Strategic Human Resource Management:** Requires management of people in an organization strategically.

**Classical Approach:** Traditional accepted views on management

**Neo-Classical Approach:** Puts emphasis on Human Relations

**Modern Approach:** Combines classical and neo-classical approach

- **Scientific Management:** Emphasizes organized knowledge rather than on rule of thumb
- **Gantt Chart:** Developed by Henry Laurence Gantt to compare the actual and planned performance in production planning.
- **PERT:** Project Evaluation and Review Technique used in scheduling and managing complex projects.
- **Contingency Theory:** Emphasizes manager's learning and interpretation of various situations
- **Theory Z:** Combines the Japanese and American approaches to develop modified management practices.

**REVIEW QUESTIONS**

1. Define the term management. Which approach to management is considered by you to be more relevant in today's organization?
2. Describe the management process using a diagram. Explain each process, keeping in view its importance in today's organization.
3. Examine the following statements critically:
  - (a) Management is both a science and an art
  - (b) Management principles are not universal
  - (c) Management lacks in social responsiveness
  - (d) Management optimizes the utilization of constraining resources
4. 'Planning, organizing, coordination and control are basic functions of management.'—Comment on this statement.
5. (a) 'Management is a profession'. Do you agree with this statement? Give your reasons. Also explain the social responsibility of management.  
(b) 'Management principles are universally applicable'. Critically comment on this statement. Also, explain briefly the various principles of management.
6. Briefly discuss various schools of management thought.
7. What are the important features of a bureaucratic organization? Point out the merits and demerits of a bureaucratic organization.
8. Explain briefly the contributions of F.W. Taylor to the evolution of management thoughts.
9. What are the principles of management as per Henri Fayol? Do you think all these principles are relevant in today's organization?
10. Discuss the major findings of Human Relations Theory and examine how this theory contributes to organizational effectiveness?
11. Distinguish between neo-classical and classical approaches to management. What are their advantages and disadvantages?
12. What are the important characteristics of modern management thought? How they are different from earlier approaches?
13. Examine the importance of Contingency Approach and Systems Approach to management.
14. Discuss the contributions of McKinsey, Peter and Waterman in the development of modern management thought.
15. Short Notes:
  - (a) Social Audit
  - (b) Managerial Activities
  - (c) Management by Objectives
  - (d) Decision Making
  - (e) Staffing
  - (f) Hawthorne Experiments
  - (g) Situational Approach
  - (h) Esprit de Corps
  - (i) Scalar chain
  - (j) Contemporary School of Management Thoughts
  - (k) McKinsey's 7-S Framework
  - (l) Theory Z
  - (m) Search of Excellence

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 2005. *Business Management*. Kolkata: Santra Publications.
2. Drucker, Peter. 1954. *Practice of Management*. New York: HarperCollins Publishers.
3. Dale, Ernest. 1965. *Management Theory and Practice*. New York: McGraw Hill Book.
4. Massie, Joseph L. 1987. *Essentials of Management*. New Jersey: Prentice-Hall, Delhi.
5. Koontz, H. 1961. 'The Management Theory Jungle'. *Academy of Management Journal* 4 (3):174-88
6. Ouchi, W. G., and A. M. Jaeger. 1978. Type Z organization: Stability in the midst of mobility. *Academy of Management Review*, April: 305-314.
6. Argyris, C. 1964. *Integrating the Individual and the Organization*. New York: Wiley.
7. Peters, I. J., and R. H. Waterman. 1982. *In search of Excellence: Lessons from America's Best Run Companies*. New York: Harper & Row.

## 2

## Organizational Planning

### LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- know the concepts and definitions of planning
- appreciate the importance of planning in organizations
- know the policy formulation for plans in organization
- understand strategy and its various levels
- grasp the strategy formulation
- be familiar with budgets as facilitator of plans
- understand forecasting
- be familiar with various forms of decision making

### INTRODUCTION

Planning is an all-pervasive and fundamental function of management. It involves deciding in advance, what is to be done, where, how and by whom it is to be done. Through planning, the manager projects a course of action for the future aiming to achieve the desired results for the enterprise as a whole and each department within it. Thus, merely assessing the future is not planning till it is followed by making provision for it. Planning is a rational approach to the future. An executive, while managing, has to plan and initiate necessary actions for its successful implementation.

Planning involves choosing from among alternatives, the proper course of action and calls for decision making, which is an intellectual process. It is the task of planning to take advantage of opportunities and minimize the risks. This calls for mental predisposition to think before acting. Moreover, planning is not a guess work. It is a conscious determination and projection of a course of action for the future, and it is based on objectives, facts and considered forecasts.

Planning is the most basic management function. As a matter of fact, all other functions of management largely depend upon planning. Control for example, is a necessary corollary of planning

and cannot exist without planning. Organization is also set up with a plan and objectives in mind, and people are invariably guided and motivated towards accomplishing the enterprise objectives. Planning, is, therefore, the primary function of management.

Management is a dynamic process and planning as its functions cannot be exception to it. Planning process is continuously repeated. Moreover, as plan begets a number of sub-plans and since plans have to be revised in the light of changing environment, planning becomes a continuing necessity for the management.

Planning is useful at all levels and in every organization. Sometimes, planning is erroneously described to be the prerogative and responsibility of the top management alone. In fact, planning is a process of choosing from among several alternatives, the future course of action is basically the same whether it is at the supervisory level or at higher echelons of management, though planning horizons broaden as one goes up in the levels of management hierarchy.

### IMPORTANCE OF PLANNING

Planning provides the framework within which organizing, staffing, direction and controlling are undertaken. The importance of planning in any organized cooperation needs no over emphasis. More specifically, planning is useful because of its following contributions:

#### Planning Makes Personnel Conscious of Enterprise Objectives

In any planning, the first stage is the deliberate statement of organizational objectives and departmental objectives. Such statement helps employees to see the organization in its entirety and see how their actions contribute to its ultimate goals. Since, objectives represent end points of planning, management should be aware of the future and revise its plans in the light of possible changes so that goals can be accomplished more effectively.

#### Efficient Planning Helps to Achieve Economy in Operations

Planning is always done with an eye on economy and efficiency in operations. As an all-pervasive function, planning improves effectiveness of all other functions of management and also helps to secure coordinated efforts throughout the organization. Since, it involves choosing, planning facilitates choice of the best method and also helps identify alternatives expected to produce desired result with minimum risk.

#### Planning Precedes Control

Control consists of those activities that are undertaken to force events to conform to plans. Planning is then the necessary prerequisite for control. Management's function of control seeks to check the performance against some predetermined standard of the projected course of action established through the planning process.

#### Planning Provides for the Future

Though forecasting is its essential characteristic, the task of planning does not end merely with assessing the future. Providing for future contingencies is an equally

important part of planning. It is through planning process that the management is made to look to the future and discover suitable alternative course of action. To the extent future changes can be correctly predicted, planning helps management to have a clear view of the future and chalk out a suitable programme of action. As a rational approach to the future, planning provides for unexpected events and arms the management against undesirable changes.

### Planning Enhances Efficiency of Other Managerial Functions

Planning, organizing, staffing, direction and control, all account for and have their due contribution to the accomplishment of group goals. Importance of each of them to the success of management job cannot be overlooked. However, planning as a primary function goes a long way in improving efficiency of other functions of management and makes the tasks of managing more effective.

### COMPONENTS OF PLANNING

Planning components are usually classified as objectives, policies, procedures, programmes, budgets and strategies. These are discussed in detail in the following:

#### Policy

A policy is a predetermined established guideline towards the attainment of accepted goals and objectives. Such guidelines facilitate properly designed efforts to accomplish the strategic intent. Policy is not a strategy or tactics. Strategy is a proposed course of action to exert a far-reaching impact on the ability of the enterprise to attain its goals. Strategy relates to means.

A policy can be differentiated from objective, programmes and procedures. Policy relates to the fundamental framework of principles and rules which are used as reference information for decision making and provide a constant pattern of decisions and structured thought process. Objectives are specific goals or aim, preferably in quantitative terms and can be considered as something which an individual or group seeks to accomplish. Hence, an objective is something to accomplish, while a policy is a guide to accomplish it.

Again policy is different from procedure, as procedure defines the manner or way of accomplishing something, i.e., it is the process and method. While policy forms the part of a framework of general principles, a procedure necessarily indicates how to do something and direct employees towards the accomplishment of goal. Policies are also differentiated from programmes. Programmes are developed on the basis of policies with a view of implementing them and accordingly, programmes involve one additional step beyond policies to simplify the decisions. The execution of programmes leads to specific actions including practices and procedures.

Policies cover a wide variety of subject. A comprehensive coverage of policies embrace any action or decision, taken by either employees or management in relation to the working environment, the rights and responsibilities of employees and management and the action of both parties. Thus, one policy may be a statement of standards for employee attendance and also a statement of management obligations in grievance administration. One policy may explain conditions under which loans would be granted, whereas, another may indicate conditions under which an employee is subjected to discharge.

Procedures prescribe the details for carrying out policies. They spell out specific rules and regulations, the steps, time, place and personnel responsible for implementing policies. Procedures also clarify what is to be done in particular circumstances.

### **Purposes of Policy**

Statement of policy constitutes criteria for making decisions. They render decision making easier, more routine. They permit decisions on problems without detailed analysis and thus facilitate saving of precious time.

Policies provide a clear idea of what management and employees can expect. Therefore, policies promote consistency and fairness of action under conditions that are similar in character and eliminate any bias in employee-related decisions. This way, policies help in avoiding confusion and misunderstanding.

### **Origins of and Responsibility for Policy**

Policies may originate from anywhere inside an organization or from the external sources—the community, state and national legislation, changes in the economy and even international forces, such as war-time or defense conditions. Internally, policies have their inception in employees' suggestions or complaints, in collective bargaining and at any level of management—staff or line management staff.

The approval of new or changed policies ultimately comes from the top management. However, the responsibility for administration rests with the line. The concerned department of an organization recommends policies and policy changes that it considers appropriate for the benefit of the organization. The department also has to assist in communicating policies to those who should know about them. There are many ways of communicating the policies like, standing orders, house journals and circulars or through documented policy manuals.

### **Considerations in Developing Policies**

In formulating policies, the first consideration is the objective or purpose. Operationally, it is also necessary to consider the economic (costs) and benefits in relation to the size and complexity of the organization. Then comes the need for determining the policies' acceptability to the management and to the employees, and this depends to a great extent on its administrative feasibility and its fairness to the employees.

Due to an unfortunate tendency to think of policies as formulae that obviate the need for careful thought, it is necessary to anticipate circumstances that may arise subsequently in administration. Imagination is required here, as well as knowledge of operating problems. Supervisors are in a good position to aid in projecting exigencies that can arise under a particular policy.

For Human Resource Management or HRM-related policies, unions have a tremendous impact on policy formulation. They seek certain policies; they seek to alter management policies (e.g., in overtime payment); and they cause concerns without unions to change policy as a defense against unions. Some unions' influence on policy administration appears to be beneficial, whereas, some are harmful to employee relations.

### **Guidelines for Policy Formulation**

A number of guidelines for policy writing have been well established and are worth enumerating.

1. **Purpose:** A statement of purpose or rationale that helps to understand and ensures acceptance of the policy.
2. **Semantics:** Choice of words should be geared to the educational level of the group for whom the policy is intended. Wording should avoid irritating expressions that antagonize, denote inferiority or cast aspersion, e.g., 'You are forbidden.'
3. **Tone:** A warm, understanding tone helps to show the interest and concern of management. This means avoidance of legalistic language as much as possible.
4. **Form:** An outlined form may be useful for management reference and application. But outlines are difficult for employees to follow; they repel reading and are cold and lifeless. Relatively short paragraphs, some use of underlines and adequate spacing (double rather than single) encourage reading.
5. **Clarity:** Short sentences are better than long ones linked together with 'whereas', 'provided', etc., and simple sentences are easier to read and comprehend than the complex or compound ones.

### **Communicating the Policies**

Management has a definite responsibility to see that employees become familiar with any policies that affect them.

Written explanations of changes in policy, reinforced by oral discussion, are minimal for policy communication. All of the written media found in organizations may be used—employee hand books, bulletin boards, company periodicals, etc. In orientation sessions for new and old employees, oral explanation can be accompanied by visual aids such as film strips, placards and funnel boards.

### **Administering Policies**

Uniformity in administration is desirable when circumstances are similar among the various individuals and groups concerned. Customs amongst various groups, practices that have been in operation for sometime and needs of different groups of employees, etc., influence decisions in regard to degree and extent of uniformity. Also, the questions of fairness and employees' attitudes toward concession in specific cases should be weighed. Long standing policy differences between office and shop, for example, are under constant fire from unions.

Questions of rigidity of administration and consistency or flexibility of interpretation must also be faced. In weighing special consideration to an employee or penalty for a violation, many factors must be taken into account, such as, work record, demonstrated capability, history of relationships, impact on other and on future situations, knowledge at the individual's disposal, past practices, responsibility of management, nature and frequency of the request or act, obligations to the organization, to the employee and to society, respective values, reasons, ameliorating circumstances and so.

## Programme

Programme consists of the entire broad course of action governing employees at all levels (including management) in an organization. Like any other programme of management, it can be thought of as a 'stable plan of action that continues over an extensive period of time.' It is the end product of philosophy, values, concepts, principles, policies and procedures.

## Strategy

Strategy is the direction and scope of an organization over long term, matching its resources to its changing environment and in particular its markets, customers or clients, so as to meet stakeholders' expectations.

*Strategy is primarily concerned with:*

- Scope of an organization's activities
- Matching of the activities of an organization to that environment in which it operates
- Concerns with resource implication
- Affects operational decisions
- It is affected by the values and expectations of stakeholders
- It is the long-term direction

## Levels of Strategy

*The levels are discussed as follows:*

### Corporate Level

Corporate level strategy addresses the following issues:

- Overall scope of an organization
- How to run in structural and financial terms
- How resources are allocated to different operations

Corporate level strategy is influenced by mission of the organization.

### Competitive or Business Strategy

These strategies are adopted in order to strengthen the position of the organization in the market. It explains:

- How to compete in a market
- Which products or services should be developed and offered to which markets
- To what extent it meets customers' needs
- Whether it achieves the objective of the organizations, viz., long-term profitability, market growth and efficiency

### Operational Strategies

Operational strategies are adopted at the functional level and the success at the functional or operational level ultimately enables an organization to achieve the corporate level and competitive strategies.

Strategy, therefore, is either the plans made or the actions taken to help an organization to fulfill its intended purposes. Strategic plans for the future is known as the *intended strategy*, and strategic actions are known as realized strategy. Strategic means are plans and policies while strategic ends may be either broad (vision and mission) or focused (goals and objectives).

From operations manager's point of view, it is important to study the following factors while adopting operations strategy.

- The number, type, size and location of operations facilities
- Type of equipment that will be utilized (focused and specific or for general-purpose and flexible, automated or principally manual)
- Make decision
- Organizational structure whether it is suitable to accomplish and coordinate all the necessary efforts
- The work force selection, employment security, compensation methods and management style
- The information systems that will be used to collect, analyse and distribute information on production, purchasing, inventory, quality, personnel, etc.
- Production planning, scheduling and control, system and inventory policy
- The quality control and improvement methods that will be used
- The productivity improvement methods—machine/manpower

## Functional and Grand Strategies

Functional strategies guide functional actions to implement grand strategy. Grand strategy provides general direction while functional strategies give specific guidance to managers for accomplishing annual objectives. Functional strategies, therefore, translate grand strategy at the business level into action plans for the organization. Operating or functional managers develop such strategies taking into cognizance the policy guidelines. Therefore, time horizon for such strategies may be a year or less. Grand strategies, on the other hand, are framed with a long-term perspective at the corporate level.

Formulating functional strategies at each operational level, at the outset, requires identification of critical success factors. For example, marketing strategies need to focus on product, price, market place and market and promotion. Finance strategies may focus on capital acquisition, allocation, dividend, working capital management. Research and developmental strategies focus on basic research, commercial development, time horizon, organizational fit, basic R&D posture (defensive, offensive, innovation, development, etc.).

For evaluating a strategy, we consider its internal and external consistency, its appropriateness in terms of available resources, its degree of risk (which should be reasonable), its time horizon (not too long to face the risk of obsolescence) and its workability.

## Framing Strategy

Strategic plans are process of thinking through the current mission of the organization with due cognizance of current environmental conditions—both external and internal. Such plans, therefore, set guidelines for future decisions and results.

**Vision**

It is the category of intentions that are broad, all inclusive and forward thinking.

- It describes aspirations for the future
- It does not specify the means that are used to achieve the desired ends
- It must be inspirational
- Visions are often unwritten
- It must be communicated

Communication of vision can be done in two ways (i) in the form of mission statement (ii) through personal selling (e.g., behaviour of the visionary). Attitude towards quality, handling the customers' complaints, etc., are examples of vision or intentions of an organization.

**Mission**

- A vision in tangible form is a mission statement.
- A mission statement verbalizes the vision

A mission statement attempts to answer the following questions:

- Basic purpose of the organization
- Unique or distinctiveness of organization
- Expected difference in business in coming three to five years
- Principal customers, clients or key market segments
- Principal goods and services, present and future
- Principal economic concerns
- Basic beliefs, values, aspirations and philosophical priorities of the firm

*Key Elements of Mission Statement are as follows:*

- *View of the Future*
  - o The anticipated regulatory, competitive and economic environment
- *Competitive Arenas*
  - o The business and geographic business arenas where the company will compete
- *Sources of competitive Advantage*
  - o The skills that the company will develop; a description of how the company intends to succeed

*Benefits of mission statement are as follows*

- Establish boundaries to guide strategy formulation
- Acknowledge responsibilities to various stakeholders and establish standards for organizational performance
- Suggest standards of individual behaviour

**Goals**

A mission statement tries to make a vision more specific, whereas, goals are attempts to make a mission statement more concrete.

Goals have several features as under;

- They address both financial and non-financial issues
- They facilitate reasoned trade-off (range of goals should be perfectly consistent with one another)
- They can be reached with a stretch
- They cut across functional areas

**Objectives**

- They are the operational definitions of goals
- They describe what the organizations hope to accomplish

*Characteristics of objectives:*

- They can be measured
- They indicate time dimension
- They reduce conflict or misunderstandings

**Comparisons between Policy and Strategy**

*Policies—*

- are general statements or understandings
- guide managers' thinking in decision making
- ensure that decisions fall within certain boundaries

*Strategy—*

- is the direction
- is concerned with the deployment of human and material resources
- increases the chance of achieving selected objectives

Strategies and policies are put into practice by means of plans. Tactics are the action plans, through which strategies are executed.

**Strategic Control**

Strategies are selected and implemented over time. But strategies being forward looking, designed to accomplish the objectives in future, it is necessary to enforce control over strategies.

Strategic control, which can be enforced by certain operational controls, are designed to answer following questions:

- Are we moving in right directions?
- Are key things falling into place?
- Are our assumptions about major trends and changes correct?
- Are the critical things we need to do being done?
- Do we need to adjust or abort this strategy?

- (f) How are we performing?
- (g) Are we meeting objectives and schedules?
- (h) How are costs, revenues and cash flows matching projections?
- (i) Do we need to make operational changes?

To establish strategic control:

- (a) Allow the time between initial implementation and achievement of intended results.
- (b) Steer the organization through different action (like undertaking of project, investment, etc.), environmental situation and firm's internal situation.
- (c) Correct the actions and directions of the firm as required by certain developments and changes in external environment and internal situation.

#### Types of Strategic Control

There are four basic types of strategic control:

- (a) Premise Control
- (b) Implementation Control
- (c) Strategic Surveillance
- (d) Special Alert Control

*Premise control* is designed to check systematically and continuously whether or not the premises set during the planning and implementation process are still valid, for example, a bank may adopt an aggressive marketing strategy to achieve 15 per cent annual growth, establishing a planning premise that not more than 10 per cent would be their non-performing assets. Premise control should be ensured monitoring the non-performing assets at the branch level on a regular basis.

*Implementation control* is designed to assess the overall strategy results associated with the incremental steps and actions that implement the overall strategy. To take an example, an internationally known fast food centre decided to maintain 3:1 company-owned franchise ratio as the part of their expansion strategy, to ensure control over the quality of foods, rates, etc. However, growing competition in this business later forced them to reverse the ratio to accelerate its ability to open new locations.

*Strategic surveillance* is designed to monitor a broad range of events inside and outside the company that are likely to threaten the course of the firm's strategy. To take an example, in the early years of its attempt to sell the PGDBA CFA Course, ICFAI made its course more finance oriented, covering all conceivable finance-laden papers, targeting the financial services sector as the prospective employers of their students. Now, financial services sector being highly unstable for market volatility, ICFAI felt the need to target other sectors as the prospective employers of their students with adequate shift in focus to PGDBA papers like; Marketing, HRD, Information Technology, Strategic Management, etc.

Similar shift in focus was adopted by IBM in marketing their large expensive mainframe computer worldwide, from corporate house to libraries

*Special alert control* is the need to thoroughly and often rapidly, reconsider the firm's basic strategy based on a sudden, unexpected event. To take an example, political coup or civil war in a country would put pressure on exporters to those countries, who may have to thoroughly reconsider their export strategy. Another example would be a major airline facing a devastating effect after an air crash.

#### Operational Control Systems

Strategic controls are useful to top management in monitoring and steering the basic strategic direction of the company. However, operating managers also need control methods appropriate to their level of strategy implementation. The primary concern at the operating level is allocation and use of the company resources. Operational control systems guide, monitor and evaluate progress in meeting annual objectives. Usually, following steps are taken for operational control:

- (a) Set standards of performance
- (b) Measure actual performance
- (c) Identify deviations from standards.
- (d) Initiate corrective action or adjustment

There are three types of operational control systems. These are— budgets, schedules and key success factors.

#### Budgets

Budgeting is the formulation of plans for a given future period in numerical terms. It is statement of anticipated results, in financial terms (as in revenue and expense and capital budgets) or in non-financial terms (as in budgets of direct labour hours, materials, physical sales volume or units of production). The Institute of Cost and Management Accountants of England and Wales defines a Budget as 'a financial and/or quantitative statement, prepared prior to a defined period of the time for the policy to be pursued during that period for the purpose of attaining a goal objective.' As budgets provide standards of performance, they usually become the basis for control. All results and performances are measured and appraised against budget standards, which are developed through a comprehensive budgetary programme. Control exercised for the execution of budgets is known as budgetary control.

Budget making is concerned with the planning function of management, while budgetary control is associated with controlling in organization. Budgetary control is 'the establishment of objectives relating to the responsibilities of execution to the requirements of a policy and the continuous comparison of actual with budgeted results, either to secure by individual action the objective of that policy or provide a basis for its revision.'

#### Characteristics of Budget

1. Budget is essentially for a given period.
2. It differs from objectives and policies because it is set down in specific numerical terms.
3. A good budget is flexible.

4. It secures maximum participation of the entire organization both in preparation and follow up.
5. Budget is fundamental to the organization. It generally receives attention and support of the top management.

### **Classifications Yardsticks**

1. By coverage of functions
2. By characteristics of activities
3. By period
4. By flexibility

### **Purpose of Budgeting**

Budgeting is used for a variety of purposes. Some of the basic general purposes for which budgeting is used are as follows:

#### *To Develop an Organized Procedure for Planning*

Budgeting is used as an aid to planning and budget is sometimes known as the profit plan. A budget requires planning and is also in itself an instrument of planning. Budgeting involves anticipation of results and expressing them in numerical terms. Forecasting or projecting a future course of action that is implied in budgeting is essentially a planning process. Comprehensive budgeting forces the management to develop a network of objectives and policies and plans for all the phases of operations of the enterprise.

#### *Means of Coordination*

Budgeting is also used for coordinating the activities of the various divisions of business. While preparing budgets, information must certainly be required relating to divisions and activities in the enterprise. A sales budget, for instance, cannot be prepared without knowing about production programme of the enterprise. The very act of preparing budgets, therefore, demands coordination. The process of integrating various budgets into a master budget also highlights the importance of coordination implied in budgeting.

#### *A Basis for Control*

Control represents the most widely known use of budgeting. Events can be compelled to conform to plans only when there are predetermined objectives and standards. Budgeting forces management to lay down objectives, goals and plans in numerical terms. It thus provides the yardstick for the measurement of performance so essential for effective control. Budget reports analyse the deviations and also suggest corrective actions. Thus, budgeting is also used as an aid to managerial control.

#### *Budget to Control Cost*

Individual budget for each operation or department helps the management to know separately the cost for each of them and thus exercise effective control over cost.

The departmental manager who notices substantial deviations from budgeted costs for operations under his control, feels compelled to curtail the extra expenditure and think very seriously about controlling the cost.

#### *To Increase Efficiency in the Field of Production*

Very often than not, budgetary control necessitates preparation of separate production budget and thus, helps determine progress and efficiency of the production.

#### *To Determine Capital Requirements*

Budgeting is also employed to determine capital requirement of the enterprise. This is possible through computing financial flows at different phases of all the operations of the enterprise as reflected in various budgets.

#### *To Encourage Research and Development*

Budgeting also aims at encouraging research and development. Comparison of actual performance with the budgeted goals and plans and thorough analysis of deviations particularly of key factors provide a sound basis for research and development.

#### *To Increase Utility of Cost Records*

Budgeting entails considerable use of cost information and records. Thus, budgetary control adds meaning to cost records and increase their utility.

### **Reporting**

The essence of budgeting lies in taking proper corrective actions to rectify the negative deviations. It can be achieved if the management has full information about the deviation. Management can be fed with the requisite information if effective system of reporting is in operation. Reporting is, therefore, extremely important in a system of budgetary control.

Reports should be drawn up in such a manner as to enable management to realize at a glance where its attention is needed. Hence, the application of the principle of management by exceptions is inevitable here. The whole system should work like the nervous system in human body where all information about whatever is happening is noted, but the mind is burdened only with that information which requires some action.

Following factors merit consideration in respect of reports:

1. The report should be factual and objective.
2. The report should relate to a definite period of activity and should be prepared in such a way that the responsibilities of various persons and departments are clearly demarcated.
3. The report should be brief, concise and clear.
4. The report should be specific in respect of exceptional aspects so that immediate action can be taken by the management.
5. Reports which no one uses should be immediately stopped.

6. A copy of the report should be sent to the person responsible for the activity covered so that he is kept informed about the progress of his work.
7. Above all, the report should be prompt even if it contains the permissible degree of inaccuracy.

### Forecasting

Forecasting is defined either an estimate or inference of a future event. Forecast may not always be an accurate estimate or inference as it is always done on the past trend. However, forecast provides an effective basis for planning different activities of an organization. From managerial point of view, forecasting is important for planning, scheduling and controlling the system to achieve efficient result.

#### Steps in Forecasting

Following basic steps are required for effective forecasting:

1. Identify the objectives for which forecasting is done. From manager's point of view, forecasting objectives may be reducing the problem of overloading in serving the customers by enhancing the number of service counters, initiate changes in design of a product and measure customer's response pattern, etc.
2. Determine the time period of forecast, which may be long run or short run. Depending on the time period, managerial decisions and actions may vary. To illustrate, if an organization requires extra manpower for a period less than one year, instead of direct recruiting, they may avail the services of some outsourcing agencies (who make people available on hire).
3. Select the right forecasting method in line with the objectives of the organization and the time frame. To take an example, annual sales forecast (for an existing organization) is better done using Time Series Analysis, while Delphi Technique or market research methods are best applied where collective opinions are required to be assessed.
4. Collect required data and information matching with the selected forecasting method. For the time series analysis, past data is collected, whereas, for market research, the primary data are collected by conducting survey.
5. Implement results for managerial decisions (planning and control).
6. Periodically evaluate forecasting, by assessing degree of error and reliability and revise.

#### Types of Forecast

Different forecasting techniques can be broadly categorized under three types. Those are Qualitative or Judgmental, Time-Series and Cause-Effect Models. Depending on the type chosen, different techniques are adopted. Qualitative forecasts involve a collection of opinions and preference, which is further, quantified using different statistical tools. Delphi Method, Nominal Group Technique, Market Research are the much used qualitative techniques.

Quantitative forecasts involve Time Series Analysis and Cause-Effect Models. Time Series Analysis uses historical data to calculate the average of past demand and results, thus obtained average is used as forecasts. Last Period Demand, Simple Average, Moving Average, Exponential Smoothing, Trend Projections, etc., are the much used techniques under Time Series Analysis.

Forecasting, using Cause-Effect Models, are done by correlation regression or econometric techniques. Correlation regression technique shows cause-effect relationship between an organization's past sales data and market or economic forces that caused changes (either negative or positive) in the demand pattern. Econometric models are used to forecast economic conditions. Like when the principles of consumption theory are used to forecast demand pattern, we use such econometric technique. Similarly, Input-Output Analysis, End-use Analysis are also some other sophisticated quantitative models.

Different forecasting models discussed above may be listed as under:

Forecast Type	Techniques Used
<b>Qualitative Model</b>	(a) Delphi Technique (b) Nominal Group Method (c) Market Research Method
<b>Time Series Analysis</b>	(a) Last Period Method (b) Simple Average Method (c) Moving Average Method (d) Exponential Smoothing (e) Trend Projections
<b>Cause-Effect Model</b>	(a) Correlation Regression Method (b) Econometric Method (c) Input-Output Analysis (d) End-use Analysis

#### Manpower Forecasting

In managing the operations of an organization, it is very important for us to perform periodic manpower forecasting. All the manpower forecasting tools explained here can also be used as the tools for planning also. To ensure understanding of quantitative tools for planning, we have explained in the context of manpower planning to understand its application in organizations.

The important points regarding the manpower are:

#### Use of Time Series Analysis

Employment data over a time period (time series) are used under this method as the basis for the manpower forecast. However, mere projecting the past into the future, without considering endogenous and exogenous changes, would increase the forecasting errors, which may be either under forecasting or over forecasting

of manpower requirements. The relevance of such change factors has been discussed earlier.

When we record employment levels over a time period, we observe following five distinct elements in it.

- (i) **Trend**, which is the fluctuation in level of employment over a time period.
- (ii) **Cyclical effects** that are the changes in employment in relation to some particular event, like economic liberalization in India or WTO resolutions.
- (iii) **Seasonality**, which is a seasonal fluctuation that occurs more than once in a given time period, like requirements of more maintenance staff in Delhi Vidyut Board during summer and rainy season while less in winter.
- (iv) **Step** is a sudden change in employment level due to economic environment or increased market share or procurement of some new machines, etc.
- (v) **Random fluctuations** are the fluctuations in employment level which are random in nature, i.e., such fluctuations do not follow any obvious pattern. This problem can be addressed by following a Moving Average Method.

Some illustrations of manpower forecasts using Time Series Analysis are given in the following.

**Moving Average Method:** Under this method, the average of the combined employment level data for the recent past is considered as the forecasted employment level for the next period. This technique is useful to guard against random fluctuations. However, it requires careful selection of time periods, which may be a 6-period, 10-period and 12-period moving average. If time periods chosen are too few, we may get wide variability in our forecast. Therefore, considering more time periods, we get better results. Whatever time periods are selected for forecasting, it is necessary to continue the same number of periods for our computations. After each period elapses, the figure for the oldest period is dropped and the figure for the newest period is added for the subsequent computation of manpower requirements.

*Example:*

Godrej has the following manpower data for their health care division for the past six years:

Year	Manpower Level/Data (in nos.)
2004	500
2005	600
2006	800
2007	1000
2008	1100
2009	1300

You have been asked to forecast their manpower requirement in 2010 using a 6-period moving average.

$$\text{Solution: } F_m = \frac{500 + 600 + 800 + 1000 + 1100 + 1300}{6} = 5300 / 6 = 883 \text{ nos.}$$

If we are asked to use a 4-period moving average to forecast manpower for 2010, then we are required to drop the data of 2004 and 2005 and compute the forecasted manpower as under:

$$F_m = \frac{800 + 1000 + 1100 + 1300}{4} = 4200 / 4 = 1050 \text{ nos.}$$

From the above variation in results, we can well understand the danger of considering lesser time periods in manpower forecasting.

For achieving better results, weights may be assigned for different time periods at the discretion of the analyst. To take an example, the manpower level of 2004, 2005 and 2006 may be less relevant, hence, for these years weights may assigned as 1 each. For 2007, the weight may be 2, for 2008 the weight may be 3, whereas for 2009, the weight may be 4. Now, the forecasted manpower for the year 2010, would be as under:

$$F_m = \frac{1(500) + 1(600) + 1(800) + 2(1000) + 3(1100) + 4(1300)}{\sum w, \text{i.e., } 12}$$

$$\frac{500 + 600 + 800 + 2000 + 3300 + 5200}{12}$$

$$= 12400 / 12 = 1033 \text{ nos.}$$

**Exponential Smoothing:** In Moving Average Method, it is need to carry forward large volume of historical data. The need for such past records can be eliminated adopting this method. This method smoothens random errors by giving exponentially decreasing weights to historical data.

Such weight factor is indicated by alpha ( $\alpha$ ), which is a smoothing constant, a non-linear decimal value which lies between 0 and 1. The formula for the exponential smoothing model is:

$$F_m = F_t + \alpha - (A_{t-1} - F_{t-1})$$

where,

- $F_m$  = Forecasted manpower  
 $F_{t-1}$  = Forecasted demand for the previous period  
 $\alpha$  = Smoothing constant  
 $A_{t-1}$  = Actual manpower required for the previous period

*Example:*

Assume that the forecasted manpower requirement for an organization was 500, whereas, their actual requirement was 480. Considering alpha value of 0.4 (which the company feels would produce the best results), compute the manpower requirement for the current period.

$$\text{Solution: } 500 + 0.4 (480 - 500)$$

$$= 492 \text{ nos.}$$

Double exponential smoothing can also be done to get further cushion in manpower forecasting.

### *Analysis of Productivity and Other Ratios*

Productivity and performance analysis were discussed in earlier chapter. We have seen, for a short-range forecast, usually normal budgetary process is followed.

### *Managerial Judgement*

A manager has to make a judgement about the future employment levels. Such judgmental decision is based on his past experience, which he relates to past occurrences of some events and its effects on manpower plans. He has to use his judgement considering the contingencies. Combining quantitative tools with judgement yields better results. There are, however, certain pitfalls in our assumed variables. In the following paragraphs, we have examined such pitfalls, which may lead to inaccurate manpower forecasts.

### *Difficulties in Manpower Forecasts Using Quantitative Tools*

- (i) When productivity data is considered as available to decide upon the manpower requirement, it is important to understand that the productivity rise cannot always be attributable to the increased human effort. Thus, productivity increases due to changes in technology or the sum total of operational and managerial efficiency (total factor productivity approach) are needed to be integrated while doing manpower forecasts. However, developing manpower planning models integrating the above two productivity variables is not so easy for obvious computational difficulty.
- (ii) It is difficult to get units of output in the same form for all jobs. To take an example, maintenance jobs are difficult to quantify. Moreover, maintenance problem is time independent. Planning for maintenance staff is one of the difficult tasks for manpower planner. Due to this reason, most of the organizations prefer to give the contract of their maintenance function to another company or organization. Similar quantification problem is there for Customer Relationship Management (CRM). Even with CRM solutions, quantification is difficult.
- (iii) The relationship between output and manpower is not always straight forward. Increase in output may lead to the economies of scale and the resultant cost efficiency and rise in productivity, which may not be attributable to the manpower productivity.
- (iv) The effects of factors like new technology, incentive schemes, etc., upon productivity, may not be consistent over a time period. Therefore, projecting manpower requirement, considering effects of such factors may be inaccurate.
- (v) The effects of different factors may not always be linear. The interrelationship of different factors complicates the forecasting of manpower. Although we have statistical techniques like multiple regression analysis, factor analysis, etc., their computational rigours often dissuade the manpower planners from using such tools.

- (vi) Uncertainty about the future is again a major problem for the manpower planner. Thus, extrapolating on the past data may lead to a major inaccuracy in manpower estimation.
- (vii) Data on past workload factors may not be available, creating difficulty in emulating the same.
- (viii) Integration of manpower planning with corporate plans may not exist in an organization, creating problems for enterprise-wide manpower plans.
- (ix) Employees cannot always be related to output in a direct way.
- (x) Human Resource Information Systems (HRIS) may not exist in an organization. Lack of such information support system leads to inaccurate estimation of manpower.

For the obvious constraints explained above, managerial judgement along with the statistical tools, is often considered as the best option for manpower planning. Often it is said that planning for manpower within a given cost constraint, without bothering for past practices, lead to a better estimation.

### *Use of Qualitative Models for Better Managerial Judgement*

**Delphi Technique:** The word 'Delphi' has come from Greek. In Athens of Greece during ancient times, it was a convention to consult an oracle representative of God Apollo who was believed to have contact with God. During that it was only the priest who could only interpret the advice given in the oracle.

In modern times, this method is essentially a group process to achieve a consensus forecast. This method calls for the selection of a panel of experts, either from within or outside the organization, whose comments are crystallized from a series of questionnaire response and then used as the basis of forecast. A series of questionnaire are prepared from the responses received from a prior set of questions in a sequencing manner. At every stage, information obtained from the previous questionnaire is shared among the participating members, without, however, disclosing majority opinion. This secrecy is maintained since the majority opinion may have peer group influence on the minority opinion.

The procedure of Delphi Technique may be enumerated as follows:

- (i) To start with, it requires the selection of a coordinator and a panel of experts both within and outside the organization.
- (ii) The coordinator then circulates questions in writing to each such expert.
- (iii) The experts then write their observations.
- (iv) The coordinator then edits those observations and summarize, without, however disclosing the majority opinion in his summary.
- (v) On the basis of his summary, the coordinator then develops a new set of questionnaire and circulates those among experts.
- (vi) Experts then again answer such new set of questions.
- (vii) The coordinator repeats the process till such time he is able to synthesize the opinions of the experts.

The success of the process again depends on the following factors:

- (i) Experts should be so chosen that they have the requisite knowledge and skills to give the best answers.
- (ii) Questions should be relevant to the objectives.
- (iii) Criteria for evaluating responses should be consistent, unbiased and befitting with the objectives. Although, there is no universal set of criteria for evaluating responses, it is often considered necessary to follow the under mentioned guidelines:
  - (a) Consider the assessment made by the experts in terms of their knowledge in the area.
  - (b) Consider the assessment in terms of feasibility, objectives, time and resource requirement.
  - (c) Consider the assessment in terms of desirability.
  - (d) Consider the assessment in terms of extraneous factors.

**Nominal Group Method:** Like Delphi Method, Nominal Group Method also involves a panel of experts. However, the major difference between the two is that whereas, under Delphi Technique, experts are not allowed to discuss among themselves, for assessing the questions, under Nominal Group Method experts are given the opportunity to discuss among themselves. Under this method, the coordinator assumes the role of a facilitator, allowing the experts to sit together to discuss their ideas. The records of such discussions are made on a flip chart. After these round table discussions on ideas, experts are asked to rank their ideas according to their perceived priority. The group consensus is then derived mathematically in terms of individual rankings. The process, therefore, affords creativity and facilitates scientific group consensus unlike the consensus by qualification (as the coordinator ultimately decides the best course of action) under Delphi Technique.

**Market Research:** This qualitative method of forecasting is used to develop a model for consumer buying behaviour. From the published secondary source data, market size, population size, its biographical characteristics, income distribution pattern, past sales data, product groups, competitive advantages, etc., are synthesized to develop the desired consumer behaviour model. To supplement this observation, surveys are often conducted, interviewing target population (samples), administering structured questionnaire. These supplementary efforts concretize the judgment and make the forecast more effective. This technique is usually employed by organizations to forecast sales of new product or sales of established products in new markets or to forecast for long-range plan.

#### Tracking Signal for Tracking Forecasting Error

Automatic monitoring mechanism to keep a track of accuracy of forecasting models is known as tracking signal. It is the ratio of cumulative forecasting error to the mean absolute deviation (MAD). Cumulative forecasting error or running sum of forecasting error (RSFE) is indicated by:

$$\sum_{t=1}^n (A_t - F_t), \text{ where, } A_t = \text{Actual demand for period 't' and } F_t = \text{Forecasted demand for period 't'}$$

Therefore, Tracking Signal (TS) =

$$\frac{RSFE}{MAD} = \sum_{t=1}^n (A_t - F_t) \div MAD$$

Tracking Signal is recalculated every time with the availability of actual demand data and forecasting is updated accordingly. TS should be fairly small and then only one can say that the forecasting is accurate or nearly accurate. If a TS moves outside some pre-established range, it is called tripping of signal. Every time the signal trips, forecasting method is adjusted. Usually, the limit of the TS is taken to vary between 3 and 8. Let us now illustrate TS with an example of actual demand data, forecasted demand data and the resultant value of TS. Let us assume that up to period 5, we have made an initial estimate of the MAD to test accuracy of our forecasting model. For each subsequent period, we have computed TS value to understand, however, whether it is within the accepted range of 3 to 8.

In this case, the TS is less than the limit of 3 to 8 and is up to period 9. In periods 10 and 11, it undershoots the limit. As of now, the forecasting model is considered to be functioning well. However, if the trend persists even in subsequent periods, the forecasting model may have to be reassessed. Using a tracking control chart, we can plot the data to explain the situation.

Period	Actual Demand ( $A_t$ )	Forecasted Demand ( $F_t$ )	Errors ( $A_t - F_t$ )	Sum of errors	MAD	TS $\frac{\sum(A_t - F_t)}{MAD}$
1.	125	132	-7	-	-	-
2.	144	139	+5	-	-	-
3.	133	136	-3	-	-	-
4.	130	134	-4	-	-	-
5.	137	136	+1	-	4.00	-
6.	143	141	+2	+2	3.67	+0.54
7.	137	140	-3	-1	3.57	-0.28
8.	138	141	-3	-4	3.50	-1.14
9.	133	139	-6	-10	3.78	-2.65
10.	131	136	-5	-15	4.30	-3.49
11.	130	134	-4	-19	3.91	-4.86

#### DECISION MAKING

Decision making is the process to select a course of action from a number of alternatives. Like planning, decision making is also all pervasive. Like forecasting, decision making is also an important part of planning. We have explained earlier how policy documents helps in taking managerial decisions. But these are decisions of routine nature, which we also call operational decisions. Strategic

or important decisions are taken considering different alternatives. In order to be a successful manager, one has to necessarily develop decision making skills. Decision making process is similar to strategic planning, which we have explained earlier. It involves:

- (i) Diagnosing, defining and identifying the source of the problem
- (ii) Information gathering and analysis of the facts required to solve the problem
- (iii) Developing and evaluating alternative solutions to the problem
- (iv) Choosing the best decision alternatives
- (v) Communicating the decisions implementing the decisions

Various forecasting tools explained earlier help us in decision making. However, the most important tool, i.e., Decision Tree, for evaluating decision making is explained here.

### Decision Tree

A decision tree is a graphic representation of the sequence of decisions required in determining the expected values of alternative course of action. Each decision alternative is weighed by developing a pay off matrix, which depicts the probable value of each of the decision alternatives by quantifying the various outcomes and probabilities of their occurrence. Probability is the degree of likelihood that a particular event will occur. It varies from zero (no chance of occurring) to one (certain chance of occurring). Outcomes are quantified in terms of Expected Value (EV). It is the sum of values of the expected outcomes multiplied by their respective probabilities. To illustrate, suppose a manager expects 0.20 probability of earning Rs 60,000 from a business, 0.40 probability of earning Rs 30,000 from the business again and 0.30 probability of losing Rs 20,000 from the business. Such assumptions are based on his past experience or from the general trend analysis in the industry. The EV can be computed as under:

$$\begin{aligned} \text{EV} &= 0.20(60,000) + 0.40(30,000) - 0.30(-20,000) \\ &= (12,000 + 12,000) - 6,000 \\ &= 24,000 - 6,000 \\ &= 18,000 \end{aligned}$$

Likewise, the manager can now compare the expected value of Rs 18,000 with other alternatives and decide on the best alternative based on the higher expected value. Let us now analyse the following pay-off matrix:

		High Sales (probability = 0.60)	Low Sales (probability = 0.40)
Investment Alternative 1	Company-A	+30,000	-15,000
Investment Alternative 2	Company-B	+70,000	-30,000
Investment Alternative 3	Company-C	+40,000	-10,000

From the above pay-off matrix, we have to first compute the expected value company-wise for each decision alternative and then we can represent the same in the form of a Decision Tree.

EV for Companies are as under:

$$\text{Company - A (Investment Alternative-1)} \quad 0.60(30,000) + 0.40(-15,000) = 12,000$$

$$\text{Company - B (Investment Alternative-2)} \quad 0.60(70,000) + 0.40(-30,000) = 30,000$$

$$\text{Company - C (Investment Alternative-3)} \quad 0.60(40,000) + 0.40(-10,000) = 20,000$$

It is seen from the above, investment in Company-B, i.e., investment alternative-2 is the best option. Now, we are representing the observations in the form of a Decision Tree.

Apart from the Pay-off matrix and Decision Tree, Queuing Models, Distribution Models, Inventory Models and Game theory are also used as decision tools. Queuing Model helps us to reduce waiting time to ensure better service to customers. Distribution Model helps us to determine the cost effective way of distribution of products and services. Inventory Models help us to determine the optimum inventory level for both inputs (raw materials and spares/components) and output (finished goods). Game theory helps us to measure the decision outcomes under different situation of uncertainty. These, apart all the forecasting tools discussed earlier in the chapter, are also used as important tool for managerial tools. Delphi Technique and Nominal Group Technique are examples of group decision making. These apart, group decisions are taken forming various committees. The committees are briefly discussed in our chapter on Organization.

### Turning Around

With single production facility, i.e., manufacturing of cameras, Medows diversified in array of product-mix based on carefully developed plans with specific goals. Their first long-range plan (covering five years) focused on achieving 20 per cent sales from diversified product-mix (i.e., other than cameras). Subsequent five-year plans focused on further diversification, expanding into other product mix or areas. However, this initiative did not lead to success. In fact, the company experienced serious difficulties. Problems largely occurred due to wrong supplied items, which lead to defects in output; unrealistic estimation of market demand; and holding or stockpiling of huge inventory of near obsolete products.

To ease the situation, the company reorganized the planning process under a central planning staff. Their long-range plans (which are strategic plan) now outline major directions and goals for the company, keeping pace with the changing environment. Medium-range (tactical) plans, with maximum of three years duration (subject to annual revision), focus on allocation of various resources and facilities and address short-term issues to amplify long-range plans and goals. These efforts are strengthened with contingency plans to fight against any eventual adverse situations. Short-range plans focus on maximum utilization of resources to obtain results and its comparison with intended established goals. This way the company could turn around.

## MANAGEMENT INFORMATION SYSTEM (MIS) AND DECISION SUPPORT SYSTEM (DSS)

MIS is a system that gathers comprehensive data, organizes and summarizes the same in a form that adds value to managerial decision making. It is a computer-based information system for more effective planning, decision making and control. A typical MIS has four major components, i.e., data gathering, data entry, data transformation and information utilization. Most of the organizations keep centralized data base, which can be used for a wide variety of application. DSS is an interactive computer system, which is easily accessible to and operated by people, who are not computer friendly. DSS helps them to plan and make decisions. A typical DSS consists of the following elements:

- An MIS to support several ways for accessing and summarizing data
- It is a sophisticated database that allows information to access in various ways
- It is a user-friendly interface which gives the user to use simple commands (rather than complicated computer terms) while communicating with the DSS
- The database for DSS contains both internal and external information, which helps the manager to relate and benchmark (compare) his decisions
- Response time for DSS is rapid, which makes the system more effective than conventional MIS

### LIMITATIONS OF PLANNING

Even though planning is an all-pervasive and a primary function of management, planning is subject to certain limitations. Without proper understanding of such limitations, planning may result into futile exercise. We have listed some limitations of planning, understanding of which may improve the efficiency of planning.

#### Planning Premises May Be Wrong

Planning premises are the basis and framework for decisions. Understanding the planning premises with absolute accuracy is not possible. Hence, there always exists some margin of error, which obviously vitiates the plans. Difficulty in assessing the premises for planning is, therefore, the most important limitation.

#### Rapidity of Change

Every organization operates under certain internal and external environment. Environment cannot always be stable. Extent of change in internal and external environment, therefore, creates a situation of instability, making the planning job extremely difficult.

#### Time and Cost Constraints

Every organization has to plan within given time and cost constraints. Such constraints stand against the efficiency of planning. In a situation of crisis, organization may even have to take decisions on war-footing, which is literally

without planning. Non-availability of time and resources may compel the organization to come out with the best business plans.

#### Planning May Limit the New Ideas

New ideas or innovativeness in planning may not be possible because of the traditional mindset of people. Vision and philosophy of the organization and its people, if not progressive, may limit the planning initiative of the management.

Similarly, procedural and policy rigidities also come in the way of planning. Procedures, rules and policies once documented are difficult to change. Such inflexibility obviously affects planning.

#### Capital Investment Constraint

Capital sunk in the business, both in the form of equipment and employees (investment in training) often limit the planning initiative, keeping pace with the environmental changes. Managers are quite often compelled to set their planning premises, keeping in mind the capital investment, which cannot be foregone.

#### Non-Control Over External Factors

Some external factors may seriously impede the planning like sudden change in government policies, union pressures on wage hike, war, international policies (like WTO, EEC, ASEAN resolutions), etc.

Despite such limitations, organizations cannot get away without planning. Every manager has to plan systematically to achieve desired results.

### SUMMARY

In this chapter, we have extensively discussed about organizational planning. Planning is an all-pervasive and fundamental function of management. It involves deciding in advance, what is to be done, where, how and by whom it is to be done. Through planning, a manager projects a course of action for the future aimed at achieving desired results for the enterprise as a whole and each department within it. Planning provides the framework within which organizing, staffing, direction and controlling are undertaken. Planning components are usually classified as objectives, policies, procedures, programmes, budgets and strategies. A policy is a predetermined and established guideline towards the attainment of accepted goals and objectives. Such guidelines facilitate properly designed efforts to accomplish the strategic intent. Programme consists of the entire broad course of action governing employees at all levels (including management) in an organization. Strategy is the direction and scope of an organization over a long term, matching its resources to its changing environment and in particular its markets, customers or clients, so as to meet stakeholders' expectations. Objectives are the operational definitions of goals. It describes what the organizations hope to accomplish. Budgeting is the formulation of plans for a given future period in numerical terms. It is a statement of anticipated results, in financial terms (as in revenue and expense and capital budgets) or in non-financial terms (as in budgets of direct labour

hours, materials, physical sales volume or units of production). Forecasting is defined either as an estimate or inference of a future event. Forecast may not always be an accurate estimate or inference as it is always done on the past trend. However, a forecast provides an effective basis for planning different activities of an organization. In this chapter, the processes of formulation of plans using various techniques have been elaborated, so that an organization can function efficiently through effective plans.

### Key Words

**Strategic Control:** Strategy is selected and implemented over time. But strategies being forward looking, designed to accomplish the objectives in future, it is necessary to enforce control over strategy. That is why every organization enforces strategic controls through operational control.

**Forecasting:** Forecasting is defined either as an estimate or inference of a future event. Forecast may not always be an accurate estimate or inference as it is always done on the past trend. However, forecast provides an effective basis for planning different activities of an organization. From managerial point of view, forecasting is important for planning, scheduling and controlling the system to achieve efficient result.

**Decision Tree:** A decision tree is a graphic representation of the sequence of decisions required in determining the expected values of alternative course of action. Each decision alternative is weighed by developing a pay-off matrix, which depicts the probable value of each of the decision alternatives by quantifying the various outcomes and probabilities of their occurrences. Probability is the degree of likelihood that a particular event will occur.

**Mission:** A vision in tangible form is a mission statement. Mission statement verbalizes the vision. A mission statement attempts to answer the following questions:

- Basic purpose
- Unique or distinctiveness of organization
- Likely difference in business three to five years in the future
- Principal customers, clients or key market segments
- Principal goods and services, present and future
- Principal economic concerns
- Basic beliefs, values, aspirations and philosophical priorities of the firm

**Budgeting:** Budgeting is the formulation of plans for a given future period in numerical terms. It is a statement of anticipated results, in financial terms (as in revenue and expense and capital budgets) or in non-financial terms (as in budgets of direct labour hours, materials), physical sales volume or units of production.

**Programmes:** Programme consists of the entire broad course of action governing employees at all levels (including management) in an organization. Like any other programme of management, it can be thought of as a 'stable plan of action that continues over an extensive period of time'. It is the end product of philosophy, values, concepts, principles, policies and procedures.

**Vision:** It is the category of intensions that are broad, all inclusive and forward thinking. It describes aspirations for the future. It does not specify the means that are used to achieve the desired ends. It must be inspirational. Visions are often unwritten. It must be communicated.

Communication of vision can be done in two ways (i) in the form of mission statement (ii) through personal selling (e.g., behaviour of the visionary). Attitude towards quality, customers' complaints handling are the examples of vision or intentions of an organization.

**Exponential Smoothing:** In Moving Average Method, we need to carry forward a large volume of historical data. We can eliminate the need for such past records adopting this method. This method smoothens random errors by giving exponentially decreasing weights to historical data.

Such weight factor is indicated by alpha ( $\alpha$ ), which is a smoothing constant, a non-linear decimal value which lies between 0 and 1.

### REVIEW QUESTIONS

1. Explain the nature of planning. Is planning different from decision making?
2. Discuss how policies and procedures of an organization influence planning.
3. How do we set the planning premises? How does forecasting help in setting the planning premises?
4. 'Planning is an important strategic function' - Discuss.
5. Explain important qualitative and quantitative decision-making tools.
6. Explain the importance of Delphi Technique. Do you think this method ensures a consensus forecast? If yes, why? If no, what alternative method you suggest?
7. In what way MAD, MSE or Bias analysis helps us to evaluate a forecast? Which one you feel is more effective?
8. Explain the importance of Causal-Effect Models in forecasting sales of a Fast Food Centre?
9. In what way Exponential Smoothing is a better alternative than Moving Average Method in long-range forecasting?
10. ABC Corporation has experienced a steady growth in annual sales in its seven-year history. The firm has traditionally used a three-year moving average to predict sales for the coming year. The newly appointed CEO of the company feels that a simple three-year moving average is too unrealistic and results in extremely poor sales forecasts since inaccuracies in forecast may affect many important managerial decisions. The CEO of the organization has asked you to determine the best time-series technique for estimating sales by comparing:
  - A weighted seven-year moving average using the following weights: .1, .1, .2, .2, .2, .3, 3 respectively, from the oldest to the most recent year
  - A simple exponential smoothing model using an alpha of 0.35
  - Assume a 1997 sales forecast of Rs 3,05,000 and forecast for subsequent years are annual sales of previous years

Which forecasting method and why (three-year moving average, seven-year moving average or exponential) would you recommend for this historical data?

#### Annual Sales and Forecast Data

Year	Rs Sales
1997	3,05,000
1998	3,28,000
1999	3,45,000
2000	3,70,000

(Continued)

2001	3,87,000
2002	4,04,000
2003	4,05,000

11. Differentiate between the following:
  - (a) Planning and Decision Making
  - (b) Planning and Forecasting
  - (c) Planning and Strategy Formulation
  - (d) MIS and DSS
  - (e) Planning and Budgeting
12. What are the limitations of planning? Do you think planning is still necessary despite its serious limitations?
13. What are the implications of policies and producers on strategies?
14. Short Notes:
  - (a) Vision and Mission
  - (b) Strategic Control
  - (c) Grand Strategies
  - (d) Strategy and Action Plan
  - (e) Operation Strategy Factors

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 2005. *Business Management*. Kolkata: Santra Publications.
2. Drucker, Peter. 1954. *Practice of Management*. New York: HarperCollins Publishers.
3. Dale, Ernest. 1965. *Management Theory and Practice*. New York: McGraw Hill Book.
4. Massie, Joseph L. 1987. *Essentials of Management*. New Jersey: Prentice-Hall.
5. Koontz, H. 1961. 'The Management Theory Jungle'. *Academy of Management Journal*, 4(3): 174-88.

# 3

## Organizing

### LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- know the methods and process of organizing.
- understand various types and forms of organizational structure
- discuss line and staff management issues
- understand the process of delegation of authority
- know the issues regarding centralization and decentralization
- decide on span of management
- understand systems view of organization
- get familiar with organizational structure and its relationships with the systems
- know various principles of systems
- understand open systems approach in organization

### INTRODUCTION

To exploit the resources available in the organization in the right way, as per the plan, a manager has to design and pattern work effectively. Such initiative of the manager creates appropriate conditions for the people in the organization to work in a manner, which helps to achieve the intended goals and objectives. Pulling together resources and people and making all understand the importance of cooperation to accomplish a job are the functions of organizing. While planning decides what to do, organizing focuses on how to do it by properly forming groups. Therefore, like planning, organizing is also another important function of management. The behavioural scientists and the sociologist view organization as comprising human relationships in-group activities. In operational sense, however, organization can be considered as consisting of division of work among people and coordination of their activities towards some common objectives.

Organizational structure helps us to determine the authority relationships among the members of organization, and hence it influences the behaviour of individuals, groups and divisions

within an organization. Among others, the structure of an organization affects the division of tasks, communication systems, decision-making patterns and finally the way how people relate to each other. Global competition now requires many organizations to redefine their structure and even to relocate, taking advantage of the state of art technology and communication support. With reduced trade barriers under the WTO regime, presence in the global market is now the first priority for many organizations. Proximity to market, 24 x 7 customers support and economy of scale in operations, led many organizations to redefine their structure. Even the global majors like IBM, Ford, DuPont, Siemens, etc., are spreading their organization structures internationally. Global competition has also accentuated organizational turbulence, which always prompt organizations to revisit their structure and people relationship. Use of e-commerce, knowledge and information, workplace diversity and ethical issues are also prompting organizations to revisit their established process and systems and restructure every time to remain up to date.

### DEFINITIONS OF ORGANIZING

According to Stephen P. Robbins and Mary Coulter (2002), organizing means 'determining what tasks are to be done, who is to do them, how the tasks are to be grouped, who reports to whom, and where decisions are to be made'. L.A. Allen (1958), on the other hand, defined organizing as 'the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority, and establishing relationships for the purpose of enabling people to work most effectively together in accomplishing objectives'. Alvin Brown (1945) defined organizing as 'the part each member of an enterprise is expected to perform and the relations between such members, to the end that their concerted endeavour shall be most effective for the purpose of the enterprise'. Koontz and O'Donnell considered organizing as 'the establishment of authority relationships with provision for co-ordination between them, both vertically and horizontally in the enterprise structure'. Organization is essentially a formal structure of people, which is set up to achieve some defined goals. A business unit or a manufacturing unit may be termed as a business organization or a manufacturing organization, because these are essentially formal structures of persons, who strive to achieve some defined goals.

It is evident from the definitions that different authorities have used the term organizing in different ways. Most commonly used terms with regard to organizing are as follows:

- Organization is a *group of people* who are organized to achieve a common purpose.
- It is an *entity*, a unit or an establishment, which utilizes resources to achieve some common purpose.
- It shows a *structure of relationship* in an enterprise
- It is a *process*, which facilitates relating of tasks and facilities of people working in an enterprise, to achieve intended goals.

According to Arthur Young, the inventor and the philosopher, organizing can be defined in the following ways:

- It is *grouping of activities*

- It establishes *authority and responsibility*
- It describes *working relationships*

We can also define organization, organizing and organizational structure separately. The term 'organization' is used to refer a social group, which is deliberately created and maintained to achieve some intended goals. More specifically, it is defined as a formal social group. The term organization is also referred to as a process of determining activities that are required to achieve intended goals, creating various roles and ensuring effective operation of the total system. Organizing, on the other hand, is defined as a management process, which corroborates with the earlier definition of organization as a process of identifying—classifying, grouping and assigning various activities with adequately defined authority relationships to achieve intended goals. Organizational structure, on the other hand, is the outcome of organizing process. It is a framework of decision-making authority, i.e., a system of relationships, which govern the activities of the people working in the organization to achieve some intended goals. In fact, all these principles have emerged from our listed definitions of organization, given by various authorities.

### BASIC ORGANIZING PRINCIPLES

Due to the diversity in managerial style, there exists no universal principles of organizing. However, following principles are widely followed while organizing:

1. Every person should be immediately accountable to one superior only and not several superiors. This does not mean that work cannot be performed when direction comes from several superiors, but in such cases subordinates get confused and ultimately it defeats the purpose of achieving the common goals. It is always better to organize the people in such a way that there is only one superior who can give orders and to whom the subordinates are ultimately responsible.
2. Authority should be granted to match responsibility. If this is not done, it often leads to a decline of initiative in the subordinates.
3. The span of control should be appropriate to the circumstances, so that it is neither too wide nor too narrow.
4. Best use should be made of specialization.
5. Number of levels of management should be kept as low as possible. Too many levels lead to bureaucracy and to distortion or loss of communication.
6. Degree of centralization should be appropriate. Too much of centralization again may lead to delay in taking decisions and their implementation. This cripples organizations as they fail to respond quickly to both internal and external changes.
7. There should be equitable distribution of work, both in terms of variety and volume.
8. Maximum use should be made of the abilities of the staff in the distribution of duties and responsibilities.
9. There should be some definition of duties, authority and responsibility; otherwise it may lead to 'empire building'.
10. Organization should be flexible enough to accommodate change, cutting across the hierarchical barriers. Too much rigidity may weaken the competitive strength of an organization.

## HUMAN FACTORS IN ORGANIZING

Many modern authors stress the need to look at the human factors in an organization since these factors are certainly as important as the formal factors. Although there is no empirical evidence to justify such views, still many organizations emphasize these points. This includes factors like grouping of male and female employees, grouping of employees as per age group, marital status, race, religion, etc. It is suggested to maintain equilibrium to the extent it is possible considering these factors, while grouping the functions of an organization. However, it may be difficult for a relatively small organization to maintain such equilibrium. In such cases, better coordination plays an effective role.

## IMPORTANT STEPS IN ORGANIZING

Following the important principles of organizing, we can enumerate the important steps in organizing as under:

1. Enumeration and grouping of activities of the enterprise consistent with its objectives.
2. Assignment of activities to different executives.
3. Delegation of authority and placing of responsibility for carrying out the assigned duties.
4. Making provision for effective coordination between the employees and establishment of definite lines or supervision.

## IMPORTANCE AND BENEFITS OF ORGANIZING FUNCTION

Sound organization facilitates management process, encourages growth and diversification, provides for optimum use of technological improvements and promotes humane use of human skills and stimulates creativity.

### Facilitating Management

A properly designed organization facilitates both management and operation of the enterprise. Management work takes place with certainty and continuity only if appropriate functional groups are provided to help managers. The grouping and arrangement of activities directly affect operating results. If the important activities are overlooked or subordinated, the results would be detrimental. Successful managers always try to develop good structures by organization analysis.

### Encouraging Growth

The organizational structure is the framework within which an enterprise grows. This requires a flexible structure where changes may be incorporated. Moreover, sound structure facilitates growth by increasing the efficiency.

### Optimum Use of Technological Improvement

The advantages of new technological improvements can be best realized by having a suitable organizational structure. The use of computer involves costs, but it processes the information very quickly. Hence, it requires a particular organizational structure.

## Encouraging human use of human beings

This is referred to as providing psychological satisfaction to individuals in the organization. An individual contributes his best when his satisfaction is the most. One derives most of the psychological satisfaction from his work, his relationships and his working environment. In a workplace, provision of psychological satisfaction is possible through good organizational structure. The organizational structure also helps in developing people by creating provisions for training and promotional avenues.

## Stimulating Creativity

A sound organization based on specialization stimulates creative thinking and initiative by providing well-defined area of work with provision of development of new and improved ways of working.

## Coordination and Control

It facilitates coordination and control in the enterprise.

## TYPES OF ORGANIZATION

Types of organization vary from one organization to another. What may be successful in one case, may not work well in another case. There are number of approaches for classification of organizational types. Following different approaches, we can have a *closed system* and also an *open system* of organization. In a closed system of organization, 'interacting elements operate without any exchange with the environment.' It means such organization require no inputs (human, knowledge, informational or technological) from the external environment in which it operates. Primary characteristics of such organization are that it is perfectly deterministic and there is no exchange between the system and the external environment. However, today no organization can truly be closed; hence, totally closed systems of organization exists only in theory.

Open system of organization stresses on the need for flexibility and adaptability in the organizational structure and also the need for interdependence of the organization with its external environment. Louis E. Boone and David L. Kurtz (1992) defined open system of organization as 'a set of elements that interact with each other and the environment and whose structure evolves over time as a result of interaction.'

Yet in another way, organizations can be classified as *formal* and *informal*. A formal organization is a group of people working together cooperatively under an authority towards goals that mutually benefit the employees and the organization. In formal organizations, jobs are well defined with definite measure of authority, responsibility and accountability. Informal organization, on the other hand, is a network of personal and social relations, which arise spontaneously as people associate with one another. It lays emphasis on people and their relationships. In contrast, formal organization puts emphasis on official positions in terms of authority, responsibility and accountability. Informal organizations, therefore, may or may not support the formal goals and objectives. This, therefore, requires the manager to understand and recognize the informal relationships and integrate both forms of organization to achieve the intended goals.

So far we have discussed organizational types, broadly categorizing them in two perspectives—closed and open organizations; and formal and informal organizations. However, modern organization theories put emphasis on various other types also, which organizational structure have been discussed in the explanation of organizational structure.

### THEORIES OF ORGANIZATION

If we study the theories of organization from an historical perspective, we can group the theories into three major heads as under:

- Classical theory
- Neo-classical theory
- Systems theory

The classical school of thoughts was mostly concerned with the micro aspects of organization, i.e., in one way their approaches were divorced from societal issues, which in reality interact with the organization. The neo-classical approach is the process of relating psychological variables of people. It gives to some extent thought to the social aspects, if not directly, at least indirectly. The systems approach, in particular, study an organization from macro perspective. This approach ultimately recognizes that organization, in reality, is a dynamic process and exists only to be interacting with environment.

#### Systems View of an Organization

A system is a collection of parts (or sub-systems), which is integrated to accomplish an overall goal of an organization. Systems have inputs, processes, outputs and outcomes, with ongoing feedback among these various parts. If one part of the system is removed, the nature of the system is changed. Systems range from very simple to very complex. Social systems are comprised of numerous sub-systems, as well. These sub-systems are arranged in hierarchies and integrated to accomplish the overall goal of the overall system. Each sub-system has its own boundaries of sorts and includes various inputs, processes, outputs and outcomes geared to accomplish an overall goal for the sub-system.

Any organization can be viewed as a system since an organization is a unitary whole. It consists of arrangement of activities to achieve its objectives. A system is an arrangement of activities designed to get something done. The systems approach studies the entire arrangement rather than a single sub-set of organizational activities. It considers an organization in its totality.

Systems theory has brought a new perspective for managers to interpret patterns and events in their organizations. In the past, managers typically used to focus on one part at a time. The problem with that process was that an organization could, for example, have wonderful departments that operate well by themselves, but they might not integrate well together. Consequently, the organization suffers as a whole.

Now, more managers are recognizing the various parts of the organization and, in particular, the interrelations of the parts, e.g., the coordination of central offices with other departments, engineering with manufacturing, supervisors with workers, etc. Managers focus more attention on matters of ongoing organization and feedback. They diagnose problems, not by examining what appear to be separate pieces of

the organization but by recognizing larger patterns of interactions. They maintain perspective by focusing on the outcomes they want from their organizations. Now managers focus on structures that provoke behaviours to determine events, rather than reacting to events as was always done in the past.

Thus every organization effectively functions through an integrated interlocking network of sub-systems. Any organization, as a system, possesses the following attributes:

1. The system is goal oriented
2. The whole is more than the sum of all parts in a system
3. A system is engaged in processing or transformation of inputs into output
4. Various components of a system are interrelated and interdependent, and they interact with each other
5. A system acts upon its environment and is also acted upon by the environment

Therefore, an organization is considered as a system, as it draws input from the environment and also with other resource inputs like men, materials, machines and knowledge. An organization then processes these inputs and gets the output, i.e., the end product or services. Finally, with the feedback in its loop, it again tries to adjust with the environmental requirements. Systems approach in managing organization is followed primarily for following reasons:

1. It lays emphasis on the dynamic character of business, considering it as a living organism
2. It focuses on the interrelationship between business and the environment
3. It stresses on the changing environment and accordingly adjusts through managing the change
4. It provides information inputs for decision making and managerial control
5. It guides formulation of business objectives, which are sustainable, keeping pace with the environment
6. It subsumes organization as a whole, considering each unit or department of an organization as a part or sub-system. These sub-systems are both interrelated and interdependent
7. Finally, it frames an integrated structure, incorporating each sub-system as the part of the total system

Concept of systems in organization, primarily, emerged for the interconnectedness of phenomena, which could be external or internal to the organizations. With systems approach, an organization can manage the process of transformation from inputs to outputs. Although systems approach to organization has many manifestations, we are primarily concerned with the organizational structure part, which is better understood once we view an organization holistically.

#### Organizational Structure and Systems

A structure of an organization illustrates the form of an organization. The form of an organization is evident from the way various divisions, departments, functions

and people are linked together and interact. Traditionally, an organizational structure shows vertical operational responsibilities with horizontal linkages and is represented by an organization chart. The structure of an organization is proportional to its size and geographical dispersion. Vertical representation of organizational structure is synonymous to Max Weber's theory of bureaucracy. However nowadays, in complex business environment, we find more modern forms of organizational structure like flat, networked, matrix and even virtual organizations. Changing business environment, not only emphasizes the change in reporting relationships and corresponding changes in the structure in an organization, it also necessitates periodic organizational restructuring, manpower downsizing, job compositional shift and making the need for reporting to the superior redundant. Thus, organizational structure refers to a pattern or the way of grouping people and jobs in an organization. Although the terms 'organizational structure' and 'organizational design' are used interchangeably, an organizational design, per se, is a set of managerial decisions and structural elements to effect change in the organizational structure.

### ORGANIZATIONAL STRUCTURE

Organization as a structure is a particular system of arrangements, the pattern of network relations between various positions in an enterprise. It is characterized by activity-authority relationship. The structure is not accidental. The key executives determine the structure creating relationships and defining the exercise of authority.

The organization chart is a useful static model of this formal structure. As organization is a system of human relationships, social system or a total system comprising a number of interacting sub-systems, it is essential for the organizer to take into account the mechanistic and humanistic points while designing the structure. It should be so structured that personnel encounter minimum obstacles and that individuals derive maximum satisfaction while striving for accomplishment of departmental or enterprise objectives within the environment furnished by it.

Therefore, the organizational structure is a means to an end of business performance and results. It should be designed such so as to help accomplish business objectives. Peter F. Drucker (1954) suggested three ways of discovering the kind of structure needed to attain objectives:

- Activity Analysis
- Decision Analysis
- Relation Analysis

Drucker has criticized the traditional approach of classifying business functions into the categories of production, marketing, etc. He has emphasized the need for analysing each of these functions into so many activities and knowing their contribution in attaining the objectives of the business.

There is another way of looking at objectives in relation to organization. Some writers describe organization as a type of 'open system' constantly interacting with the environment for its survival and growth. The organization receives input from its environment. The organization as an open system must, therefore, define its objectives in relation to environment and constantly adapt to changes.

### Components of Organizational Structure

According to Mintzberg, an organizational structure is the sum total of the ways in which it divides its labour into distinct tasks and then achieves coordination among them. As Mintzberg believed, that an organizational structure is a configuration of systems and relationships, he suggested six components, as illustrated in the figure below:

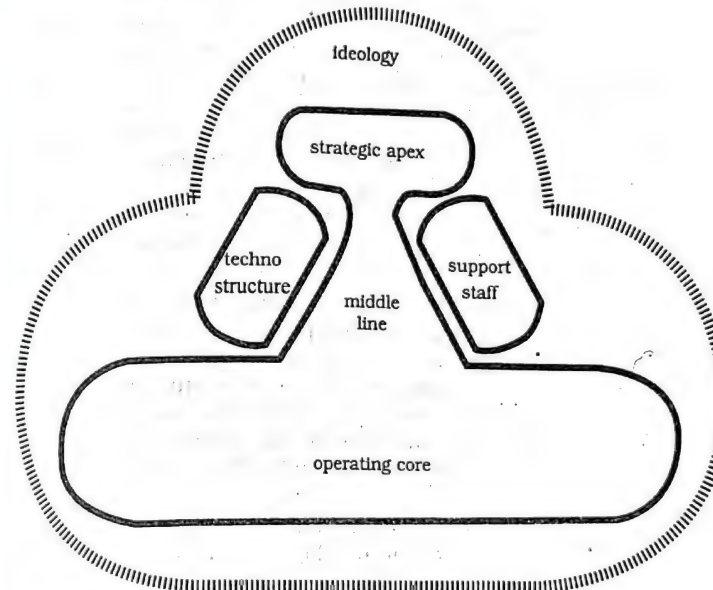


Figure 3.1: Components of Organizational Structure

Source: Organizational Configurations (Mintzberg), downloaded from [http://www.12manage.com/methods\\_mintzberg\\_configurations.html](http://www.12manage.com/methods_mintzberg_configurations.html).

People in the operating core part of an organization are involved in the production of goods and services. The strategic apex part of an organization is involved with controlling. The middle line managers align strategic apex with the operating core. People at the techno-structure core, design, plan, change or train the operating core. The support staff provides support to the organization, which is outside the operating core. Finally, ideology is the traditions and beliefs that make one organization distinctly different from another.

### Types of Organizational Structure

Organizational structure helps us to determine the authority relationships among the members of an organization, and hence it influences the behaviour of individuals, groups and divisions within the organizations. Among others, the structure of an organization affects the division of tasks, communication systems, decision-making patterns and finally the way how people relate to each other. Depending

on the specific nature of the firm, organizational structures may be standardized or open. Reviewing various components of organizational structure, Mintzberg has given us a potential classification of five different types of organizational structures. These are—(1) machine bureaucracy (standardized structure) (2) professional bureaucracy (3) adhocracy or innovative forms (4) simple or entrepreneurial forms (5) divisional forms. Each structural form indicates different pattern of behaviour of the firm.

Organizational structure that conforms to *machine bureaucracy* emphasizes the standardization of work and centralized decision making. Very large organizations like GM and Ford are examples of machine bureaucracies. This form of structure prescribes limits to behaviour and procedures for members. It makes status polarization by maintaining hierarchies and controls both their internal and external stakeholders by determining the rigid boundaries between themselves and their stakeholders. Such organizations tend to be secretive. Conservative attitude prevents internal cooperation and discourages learning for the people. Such organizations practise so much insularity that they even do not allow members of one department to enter another department. They promote competition and non-collaboration among employees.

In organizations that subscribe to the *professional bureaucracy* avoid excessive formalizations. Such organizations are managed by professional people and here the employees enjoy a high degree of functional autonomy and experience lesser control than in the organizations conforming to machine bureaucracy. They feel empowered even to cope with the external eventualities that the organization faces. Being open and cooperative, this type of organizations promote learning environment, support competency development and truly transform the employees to good performers.

The third form of organizational structure, known as *innovative* or *adhocracy* structure, relates organization to the culture. These organizations puts emphasis on developing their distinctive corporate culture. Characteristically, organizations with innovative or adhocracy structure decentralize their decision-making process and promote open communication, discussion, negotiation and interaction among people and divisions. According to Mintzberg, such firms demonstrate alliance-building behaviour.

The *entrepreneurial form* of organizational structure is simple, since a single person (usually the entrepreneur himself/herself) directs the activities of the firm. The major advantage of this form of organizational structure is that it can quickly build trust and can quickly change the existing norms, when such norms are incompatible. However, when relationships are not built on trust, such organizations may demonstrate a great amount of instability.

The fifth and the final type of organizational structure is the *divisional form*. Such form or organizational structure focuses on autonomous divisions, which, however, may not always imply decentralization of decision-making power. Often, this form of organizational structure sparks intra-unit fighting and generates *cowboy mentality*.

### Adhocracy and Bureaucracy

To understand adhocracy, let us first understand its literal meaning. The word 'ad-hoc' means 'for purpose' and the suffix 'cracy' means to crack down. It is antonym

to bureaucracy. The term was first used in 1970 by Alvin Toffler and thereafter popularized by Henry Mintzberg. According to Robert H. Waterman, Jr, adhocracy is 'any form of organization that cuts across normal bureaucratic lines to capture opportunities, solve problems and get results.' Adhocracy form of organizations is innovative and capable to solve problems. Some of the characteristics of adhocracy are:

- More organic structure
- Less formalization of behaviour
- Specialization-based formal training
- Encouragement of mutual adjustment
- Low standardization of procedures
- Roles are not clearly defined
- Selective decentralization
- Work of the organization rests on specialized team; hence, they become the power centre
- Horizontal job specialization
- High cost of communication
- Culture based on democratic and non-bureaucratic work
- Cross-departmental task forces

In adhocracy form of organizations, hierarchical barrier being absent, people across the functions get authority to make decisions and take actions concerning organizational interests.

The structure of any organization facilitates achievement of organizational goals and objectives. Hence, decisions on the type of organizational structure are very important. The most common type of organizational structure is bureaucracy. However, the bureaucratic model in itself is not an organizational structure; it can only provide hypothetical guidelines to create own business design, more of a blue print type and descriptive in nature. Thus, bureaucracy, per se, is not the final product. Adhocracy, on the other hand, is a structural system that does not consider traditional ways of bureaucracy, i.e., minus formal rules and regulations. It is flexible and quickly adaptive to the dynamic environmental changes.

Both the structural systems have their advantages and disadvantages. Each deals with situations differently. Bureaucracy is mechanical. It approaches problems systematically through predetermined guidelines. Adhocracy, on the other hand, challenges problems with a more flexible approach to ultimately achieve the final goals. Organizations with adhocracy structure can respond to the changes quickly, but bureaucratic organizations need time to respond to change, they being more rigid about procedural norms. Again in adhocracy, conflict and group rivalry may be more, whereas, in bureaucracy such occurrences are less since interpersonal relationships are more formal and the entire system is regimented. Therefore, we cannot say that a particular system is good or bad. Whether an organization is functioning well or otherwise, it generally depends on the nature and type of the activities of the organizations. The latter may be the right-fit to wither both adhocracy and bureaucracy.

## Developing an Organizational Structure or Design

Designing a new organizational structure or reorganizing an existing one calls for careful consideration of current practices and principles of the organization. There are no such rules as to which will lead to the best organization structure. But the following steps in designing or reorganizing are more effective in achieving enterprise objectives:

### *Clear Definition of Objectives*

The first step is to lay down objectives in very clear terms. This will help in determining the type, stability and basic characteristics of the organization.

### *Identifying the Activities and Grouping Them into Convenient Classes*

The next important step is enumeration of activities necessary to achieve the objectives, their grouping in a systematic manner, assignment of such groups of activities to personnel and providing for their coordination. Subject to possibility, similar functions should be combined into one position.

### *Determine the Structure*

The organizer has to decide about the span of supervision, types of organization, basis of departmentalization and the pattern of authority structure.

### *Revise the System on the Basis of Assessment of Personnel and Funds*

The last step is to assess the capacities and abilities of the people available to man different positions in the organization along with other resources at the disposal of the enterprise. The ideal organization should then be adapted to fit in the reality of the situation.

These are the general guidelines to be followed. Each enterprise should be viewed as a separate case and should be developed accordingly. It is unwise to follow a particular structural form simply because that proved more effective in one instance. Local conditions, business objectives and policies, scale of operation, nature of work and above all, character and abilities of personnel available are important factors to be considered while developing an organizational structure.

## ORGANIZATIONAL EFFECTIVENESS AND ORGANIZATIONAL STRUCTURE

Before we define organizational effectiveness, let us first understand the term 'effectiveness'. Effectiveness is the extent of an activity that helps in achieving the long-term goals. Since we measure effectiveness for specific activities, we can say that the activity-specific effectiveness is the outcome that supports the broader goals of an organization. To measure the effectiveness, we can use both the qualitative and quantitative tools. Behavioural parameters like values, attitudes, skills and behaviour are measured using qualitative tools. Value and volume of output changes, customer satisfaction, changes in the profitability, etc., are measured using quantitative tools.

Organizational effectiveness is the extent to which the organization, as a whole, achieves its goals optimizing its resources. It depends on the degree of interpersonal skills, positive attitudes, technical competencies, small group activities, etc., which

together contribute to the achievement of organizational goals and objectives. Therefore, organizational effectiveness refers to the corporate management systems that produce developmental results of an organization. Among others, an effective organizational structure helps in achieving organizational effectiveness.

## DYNAMIC ORGANIZATIONAL STRUCTURE AND DEPARTMENTALIZATION

Organizational structure should not be static. An enterprise operates under a highly dynamic environment where technological, social, political and economic setting in which it operates and the people managing the organization are continually in a flux. This calls for adapting the organizational structure to changing conditions so that it can survive and grow. Accommodating changes in the organization requires that the structure should be partly modified so as to adjust it to changes in the attitudes, ambitions and abilities of the people.

### Principles of Departmentalization

Different reasons of grouping the activities provide only the general guidelines. While grouping, the manager must consider the advantages and disadvantages of each method of departmentalization along with the basic factors involved in grouping activities of the enterprise. After such evaluation only one should contemplate on determining the kind of composite departmental structure best suited to the requirements of the organization.

Basic factors in grouping activities are:

#### *Specialization*

The organization structure should divide and group the activities of the concern in such a way that similar and allied activities are, in all occasion, put under one department. Specialization leads to better productivity with the same effort.

#### *Control*

Departmentalization should be such as to facilitate control.

#### *Coordination*

If objectives are to be accomplished effectively, departmentalization should not only facilitate control but also help in coordination.

#### *Balance*

Departmentalization should also allow adequate attention to be paid to each of the functions of the enterprise so that different activities are properly balanced.

#### *Avoidance of Duplication of Sections*

Departmentalization should as far as possible, avoid duplication of sections.

#### *Human Side*

The process of departmentalization should not overlook the human side of the organization. Impact of the structure upon human factors should be given due consideration.

### Reduction of Cost

Activities should also be grouped in the manner that would best contribute to the achievement of enterprise objectives and reduction of its cost.

### Recognition of Local Conditions

Pattern of grouping should be evolved in such a way that local conditions are given due recognition.

Apart from those listed above, following principles should also be given due consideration according to the necessity in departmentalizing of activities or functions:

- (i) Ease of direction
- (ii) Flexibility
- (iii) Optimum utilization of manpower
- (iv) Opportunities for the application of individual talents
- (v) Uniform and consistent policy of operation
- (vi) Functional efficiency in production, distribution and finance
- (vii) Clear and comprehensive channels of communication
- (viii) Contribution to the survival and prosperity of the business

### Process of Departmentalization

Process of departmentalization may be divided into following three stages:

1. Primary departmentalization, which is achieved by initial break-up of functions into basic activities
2. Intermediate departmentalization, which is done by creating departments in the middle levels of the organization
3. Ultimate departmentalization, which is accomplished by dividing activities into separate units at the lower levels

Based on the prevalent practices, an organizational structure can be framed through following four major types:

1. Functional structure
2. Divisional structure
3. Hybrid structure
4. Matrix structure

### Patterns Used in Departmentalization

The most common patterns used in departmentalization are grouping by functions, products, territories, processes and customers or by time. Apart from these, departmentalization by simple number of people was an important method in the organization of tribes and armies.

### Departmentalization by Functions

It refers to grouping of activities of the enterprise into major functional departments. The functions are usually classified into production, selling and financing. The other commonly recognized functions requiring separate groupings are buying,

accounting, personnel and research. However, these functions vary according to the organization.

Departmentalization by functions is the most widely used basis for grouping activities into administrative units and they are found in almost every enterprise at some levels or the other. An illustration of functional organizational structure is as follows:

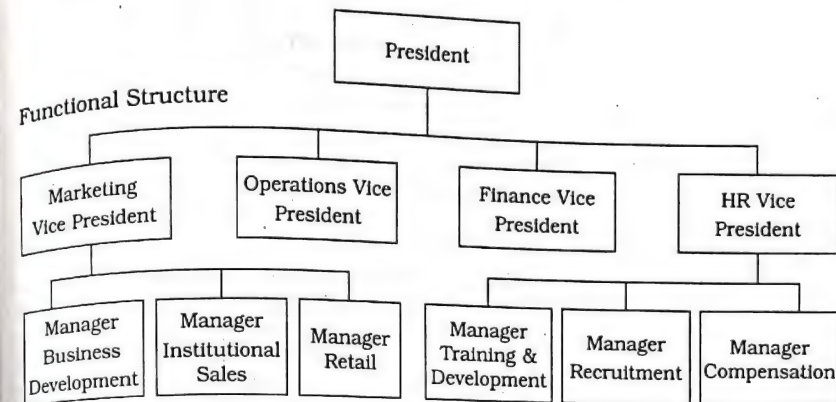


Figure 3.2: Functional Organizational Structure

This is a hypothetical organizational structure of a multi-product company having both institutional and retail sales.

#### Advantages

- (a) Functional departmentalization in an enterprise represents a very natural and logical way of grouping different activities of the enterprise.
- (b) Such grouping ensures specialization. By concentrating on similar group of activities, specialized knowledge and skill are acquired, which can be utilized for the efficient running of the departments. This leads to economy in operations and efficiency in the use of manpower and other resources.
- (c) It facilitates coordination within the employees of a particular function. It is easier for a manager in-charge of a particular function to synchronize activities and unify efforts of personnel engaged in that particular function than to coordinate activities pertaining to different functions.
- (d) Direct and adequate attention to the basic activities guarantees the availability and effective utilization of outstanding abilities.
- (e) Functional departmentalization is a time-proven method and can easily be justified by the management.

#### Disadvantages

- (a) Centralization tends to become excessive and thereby causes delay in decision making and flow of information. Decision on problems covering

two or more functions can only be made at the top of the organization. However, in the communication process of the same to the bottom of the organization pyramid decision making and its implementation is further delayed.

- (b) Functional departmentalization tends to make the functional executives so much conscious of their respective functional areas that the business, as a whole, very often remains out of the sight of those executives. This results in consumption of time in emphasizing the mission of the enterprise and makes coordination between different functional areas more difficult.
- (c) A company, which is functionally organized, does not offer a good training ground for managers who are expected to be experting in more than one function. A manager supervising a particular function more often becomes an expert in handling problems of that particular function alone and gets no hand-on knowledge of other functions.

### Departmentalization by Product or Services

When activities associated with each product or group of closely related products are combined into relatively autonomous and integrated units within the overall framework of the company, such an organization is said to have product departmentalization. Under this arrangement, an executive is put in charge of all the activities relating to a product or product line and enjoys extensive authority over production, sales, development, service and other functions pertaining to that particular product. Place or location of product unit is irrelevant here. We have illustrated a process-centric divisional structure of a Tea manufacturing company as follows:

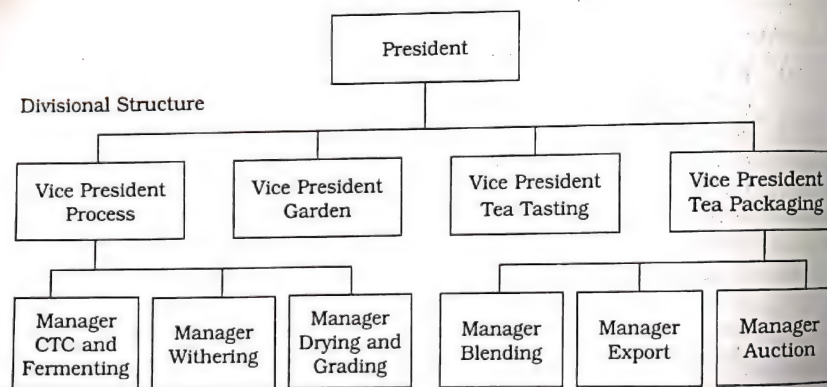


Figure 3.3: Divisional Organizational Structure

#### Advantages

Product or process departmentalization enjoys the advantage of specialized product knowledge and promotes coordination of different activities connected with a particular product. Since, the responsibility for the result of each product

is fixed, the executive, who is in charge of the product, is motivated for expansion, improvement and diversification of the product. It helps an organization to compare one product line with another, which facilitates dropping of unprofitable product lines and expansion of profitable product lines. Due to the formation of autonomous units, it also enables the organization to gain the advantages of better coordination, better customer services and better control of resources.

#### Disadvantages

Product or process departmentalization can, at times, lead to difficulties in coordination. The manager of the product, who has been successful in running his department, may well be prompted to acquire more power for himself. However, this can be remedied through centralization of certain key activities and major policy decisions at the top of the organization. Also it requires organization to hire more persons with managerial abilities who are fit to take the role of general manager, thereby raising the managerial cost. Costs are also increased due to the duplication of centralized services and staff activities. At the top management level, it can also create a problem of control for obvious difficulty in monitoring of activities of various product departments. Decision-making problems may also be faced by such organizations because top management may not like to delegate decision-making powers to the departmental heads.

### Departmentalization by Locations or Territories

Sometimes activities of an enterprise are physically or geographically dispersed in the interest of efficiency and economy in operations and this requires local administration to look after the geographically dispersed units. Such an organization is viewed as territorial departmentalization. Koontz and O'Donnell have mentioned two valid reasons favouring territorial departmentalization :

- (a) To avoid absenteeism, managers must not ignore local factors, as many local issues may be responsible for the absenteeism
- (b) To take advantage of certain economies of localized operation

Grouping by locations signifies adaptation to local needs and this facilitates prompt actions. Activities within the scope of one's area or authority can be more effectively coordinated and controlled. Such departmentalization also offers opportunity to the top management to allow employees to gain experience with minimum of risks to the firm. However, communication gap, delay in decision, etc., are its major disadvantages.

### Departmentalization by Time

When operations extend far beyond the normal work period of an individual, it may well be spread over certain shifts. Such a grouping is frequently termed as departmentalization by time. It is a normal practice in enterprises who are engaged in continuous processes, e.g., public utilities, restaurants and many others. Units so created on time basis, perform similar operations. Problems are clustered round to the extent of each shift and shall be self contained. Also, the relationships between specialized activities in normal times and during extra hours can be synchronized. Grouping by time is more common with the production function of an enterprise.

### Departmentalization by Process and Equipment

Activities may also be grouped into different departments on the basis of process involved or equipment used. Such a grouping is usually resorted to in a manufacturing concern. Thus, a cotton textile unit may have separate units for spinning, weaving, dyeing, inspection and shipping. Better supervision, optimal use of equipment, specialization and avoidance of duplication of investment are the important contribution of such departmentalization. In this case also, we follow the same pattern of departmentalization, as illustrated in the divisional structure.

### Grouping by Customers

This type of departmentalization is more popular in sales activities of the enterprise. This pattern is usually followed when paramount interest is required to be shown in the welfare and interest of the customers. Customers may be classified on the basis of age, sex, income and taste. Customer departmentalization assures full attention to the different customer groups. It helps enhancing company's image and goodwill. Since, customers are divided into identifiable groups the pattern permits the use of specialized knowledge for each of such groups.

### Hybrid Structure

This structure is a form of departmentalization, which combines both functional and divisional structure. Particularly large organizations adopt this structure to gain the advantages of both functional and divisional structures. Functional structure gives the benefits of economies of scale, in-depth expertise and resource utilization efficiencies, whereas, divisional structure gives the benefits of specialization of products, services and markets. In India, the most of the public sector units and departmental undertaking like railways, etc., follow this structure. A typical hybrid structure of an organization is illustrated below:

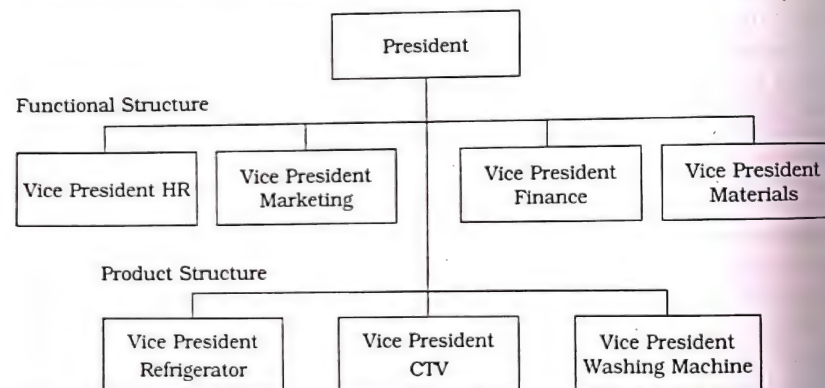


Figure 3.4: Hybrid Organizational Structure

Hybrid structure gives the benefit of specialized expertise and economies of scale in prime functional areas. It facilitates adaptability and flexibility in

handling diverse product or service lines, territories, differing needs of customers, alignment of divisional and corporate goals, etc., because of the partial divisional nature. However, this structure requires hiring of huge staff members both at the corporate level and functional (operational level). Control is also difficult because of the huge organizational structure and it also leads to conflict. Coordination between a division and a corporate functional department is time consuming, which further creates organizational imbalance.

### Matrix Structure

This type of departmentalization superimposes horizontal set of divisional reporting relationships on hierarchical functional structure. It is also known as grid organization or project or product management organization. It is a combination of both functional and a divisional organization at the same time. Therefore, it enjoys two chains of command—vertical and horizontal. A typical matrix structure is illustrated below:

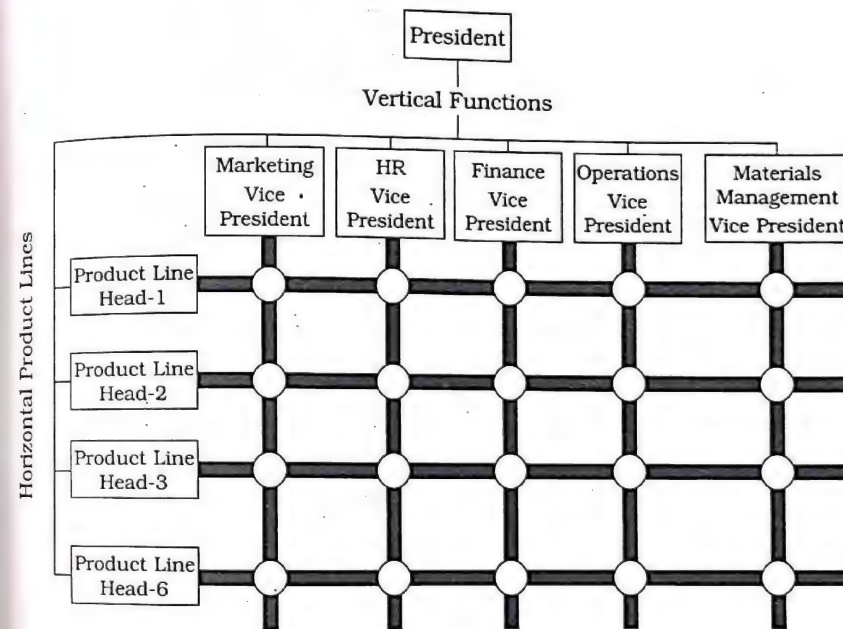


Figure 3.5: Matrix Structure

Decentralized decision making, better project or product coordination, improved environment monitoring and resultant response to change, flexible utilization of manpower and other resources (including support services) are some of the advantages of matrix structure. On the other hand, this structure requires high administrative costs, creates confusion over authority and responsibility, enhances interpersonal conflicts and overemphasizes group decision making.

Despite potential disadvantages, the matrix structure is now widely used to cope up with the increased environmental pressure and to develop competitive strategies. Unless the whole process is efficiently managed, it is not likely to benefit an organization.

Recently, we are also observing that organizations are following the concept of *Strategic Business Units (SBU)* or *Independent Business Units (IBU)*. SBUs/IBUs are set up as distinct business units to ensure that some products or product lines are promoted as independent business. The General Electric Company for the first time used this method of structuring. We have illustrated a SBU structure below:

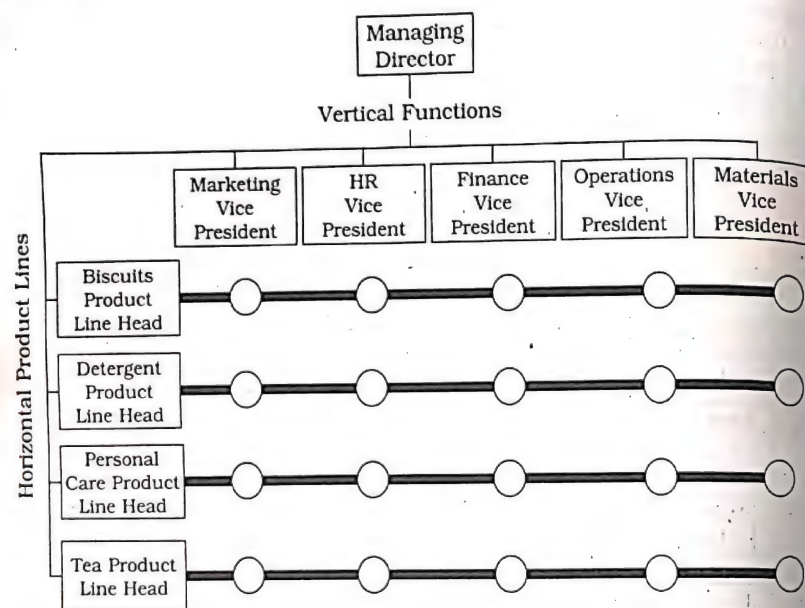


Figure 3.6: Organization Structure as per Strategic Business Unit

### Organization Structure in a Globalized World

For business imperatives, organizations today operate globally. To suit the global business requirements, organizations today frame different structures like, global, international, multi-domestic, transnational, informed, cellular and networked. A global organizational structure is not locally responsive; it does not believe in optimal sourcing, rather, it concentrates on work activities in one locale, i.e., in the country of its origin and follows a centralized approach. A global organizational structure believes in home-based operations, even though it does business globally. Strategically, this type of organization offers similar products or services worldwide, irrespective of its acceptance or otherwise in various global markets. An international organization goes beyond home-based operations. They create separate hubs for their various product- or service-mix, locating such hubs in those countries, where they

can get the benefit of optimal sourcing. These hubs in different countries work as 'centers of excellence' and cater to the world market. Multi-domestic organizations follow a decentralized geography-based approach to customize their operations, specific to the countries' requirements, where they likely to do business. They go for developing specific products and services, acceptable to local markets. Transnational organizations develop blending of the international and multi-domestic approaches to optimize their locational advantages and also to reap the benefits from optimal sourcing. They customize their product and service-mix on region basis and, at the same time, gain the advantage from their worldwide centers of operations. Unilever, Procter and Gamble and NEC are the good examples of this type of organization (Bartlett and Ghoshal, 1998). Informed organizations manage information up and down the organization, making an extensive use of computers and other related supports. They are low in virtualization and high in IT infusion (Shoshana Zuboff, 1988). Cellular organizations are characterized by small, autonomous work groups or business units, which are self governed and which can grow, reproduce and form relations, as per their need (Miles et al., 1997). In fact, they are different from our earlier discussed SBUs or IBUs in a sense that they can operate more independently, even crossing the boundary of cells. Networked organizations develop active linkage between internal and external organizations to meet the knowledge needs. They are a mix of virtualizations and IT infusion and are also active in making strategic alliances. Many organizations, in order to survive in a diverse global environment, develop a corporate culture, which is a learned, shared, relatively enduring, interdependent system of meanings that classify, code, prioritize and justify activities within the organization and towards external environments it has defined as relevant.

### Virtual or Networked Organizations

Information systems have now changed the world of business and so also the way people work. Traditionally, organizational structures are based on location-specific activities and face-to-face communication. With the advancement of information systems, organizations now operate in a distributive environment, with flexibility in the nature and way of work. This is what we call e-organization or virtual organization, which does not have a central geographical location. This organization interacts essentially through computer networks. By nature, this type of organization outsources most of their functions, because of their borderless operations and market network. Most of the global consulting and hi-tech organizations operate creating virtual organization, leveraging the information systems. In virtual organizations, which may either be temporary or permanent, virtual team and virtual projects are developed.

Rosabeth Moss Kanter (2001) mentioned about the radically transformative nature of the global network, i.e., the new e-world, which connects every one with everyone else. This requires new operating environment, new forms of business, working and organization. To survive in this era of e-revolution, organizations need to be innovative, shifting from their traditional hierarchical bureaucratic systems and structure. Kanter identified four key elements of an effective organizational e-culture. First, there should be an improved strategy to come out with new products and services, followed by the urge to become big through partnerships and collaborations and the urge to operate as integrated communities, removing the internal barriers. Finally, it should become talent dependent or driven.

E-organizations have three important characteristic features.

These are:

- Management of production process, encompassing procurement, stock replenishment, payment processing and control over vendor and production activities through electronic links
- Management of customer-centric activities, encompassing marketing, selling, processing of customers' orders and extending support to customers through electronic information systems
- Managing internal processes, encompassing employee services, training, information sharing and even recruiting through electronic applications

Based on this premises, we have illustrated new forms of organizations.

### ORGANIZING AS PART OF THE TOTAL MANAGEMENT TASK

Organizing as a function is closely related to other phases of management. This becomes more obvious when we consider changes in the organizational structure and project effects of such changes on the other tasks of management. In fact, changes in organizational structure must be matched by suitable changes in planning, staffing and controlling the other phases of management. It becomes further clear when it is remembered that the process of organizing comes to life only in association with other tasks of management. Thus, the process of organizing should always be viewed as the part of the total management task.

### DELEGATION OF AUTHORITY

Authority delegation is the key to organization. In fact, no organization is possible without the delegation of authority, because it presumes the non-existence of subordinates in the organization and one man doing every thing. While establishing organizational structure the manager must plan some group activities, assign them to different individuals in the organization and delegate authority necessary for their effective and efficient functioning to achieve the mission of the enterprise. Delegation is thus an essential process indispensable to an organization. The principle of span of management also requires authority to be delegated to subordinates. It is obvious, therefore, that when the manager delegates authority, he creates subordinate positions and thereby makes the organization possible. While delegating authority, the manager must know what authority is to be delegated and with what limit. No manager can delegate authority, which he does not have nor can he delegate all his authority without sacrificing his position as a manager.

### Elements/Features of Authority Delegation

Delegation of authority involves three basic features irrespective of the level at which authority are passed on to the subordinates:

- (i) Assignment of tasks and duties, i.e., indicating what work subordinates must do
- (ii) Granting of authority, i.e., the executive who delegates authority must transfer sufficient right or permission to the subordinates helping them to accomplish the assigned tasks

- (iii) Creating an obligation, i.e., once duties have been assigned and authority is delegated, the responsibility for the accomplishment of tasks is then spontaneously fixed. According to Fayol, this is exaction of responsibility from the subordinates for accomplishing the assigned tasks

Thus, duties, authority and obligation constitute three important ingredients of delegation. All these three aspects are inseparably interrelated and a change in one is bound to call for an adjustment in the others.

### Barrier to Authority Delegation

The barriers to the delegation of authority are discussed as follows:

#### From Executives' Side

- (i) There are managers who prefer to withhold a larger part of their authority under the pretext that even after delegation they still continue to remain responsible for the accomplishment of tasks assigned to them. Such a psychology is self-defeating and causes real obstacles to authority delegation.
- (ii) Certain personal attitudes are also important in making real delegation. Every delegation must involve a degree of authority or discretion. The decisions of subordinate are not likely to be exactly similar to that of the manager who has delegated the authority to him. Hence, a manager should be receptive and give other individuals' ideas a chance. In the same way, for making delegation realistic and effective in the true sense, the manager must not only be willing to push decision-making power down the levels of organizational structure but must be prepared to allow others to make mistakes. It is all the more essential that the manager must believe and trust his subordinates.
- (iii) Lack of ability to direct well is still another barrier to the successful delegation on the part of the top executives.

#### From Staff Members' Side

Sometimes, subordinates are not very comfortable with the idea of being delegated a certain part of his superior's authority. Often it happens that a manager is willing to delegate part of his authority, but the subordinate finds it more convenient and easy to take dictation and ask the higher-up rather than to involve himself in the creative process of decision making.

Fear of criticism may also deter subordinate from accepting any delegation of authority. Lack of confidence is yet another serious problem among the subordinates.

In addition, a lack of necessary information and resources to do the assigned duties also makes the subordinates feel hesitant in accepting delegation.

### Delegation versus Decentralization

Delegation refers, primarily, to the entrustment of authority and creation of responsibility from one individual to another. Decentralization applies to a systematic delegation of authority in the wide context of an organization. Delegation

can take place from one individual to another and can lead to a complete process. However, decentralization is complete when fullest possible delegation is made to all or to most of the people and they are delegated a specific kind of authority.

Thus, delegation is the process; decentralization is the result. Delegation is from person to person whereas decentralization is usually complete en bloc. Delegation is a must where organizational structure is present whereas decentralization may be optional. In delegation, control is at the top, but in decentralization, control is at the decentralized unit. An organization can delegate well without enough decentralization. This does not mean decentralization can be totally absent in an organization. It always exists in a large or small degree in all organizations.

From the organizational point of view, there is no such thing as absolute centralization or delegation. The existence of the former may be conceptually possible in a total one-man organization.

Delegation involves sharing of either managerial work or operating work between a manager and his subordinates, irrespective of their positions. In contrast, decentralization is concerned with the sharing of managerial work only between two managers.

### **Principles of Delegation**

To make delegation more effective there are certain important guides, rules or principles. These are:

#### **Clarity of Delegation**

Whether specific or general, written or unwritten, delegation of authority must be clear in terms of its contents, functional relations, scope and assignments. Ambiguity leads to poor results and tends to make the delegation less effective.

The principle of clarity of delegation also implies defining in clear terms the horizontal and vertical relationships of the position of each subordinate to other position in the organization. Every subordinate must know what position in the organizational structure exists at his own level and how his position fits in the overall management hierarchy. Every manager in an organization, must know who are his subordinates and who are his higher-ups in the organization. This helps him both in seeking guidance and also in providing guidance in terms of scalar chain established in the organization.

Specific written delegations help both the manager and the recipient of authority. However, as one goes up the echelons of organizational structure, such specific delegations become more and more difficult.

The principle of clarity should not be taken to mean that authority relations between the subordinates and the seniors once established become immutable. With the change in the work, authority delegation should be adequately modified.

#### **Delegation to be Consistent with Results Expected**

Before proceeding with actual delegation of authority to a subordinate, a manager should know the jobs and results expected of such delegation. Only that much of authority, which is sufficient to accomplish the results, should be delegated. This principle reasons the assumption that goals are set, plans are made and that jobs

are set up to accomplish or implement them. This principle also helps minimizing the dangers of delegating too much or inadequate authority.

### **Responsibility Cannot be Delegated**

Obligation to accomplish the assigned task is absolute and is not partitioned when authority is delegated to the subordinate. The chief executive even after delegation remains accountable to the Board of Directors for management and supervision of the whole of the enterprise. If this principle is violated, three important consequences will follow:

- (a) If the manager is able to pass an obligation along with delegation of authority to the subordinates, the rule of single chain of command will be violated.
- (b) Management at the top shall have great responsibility and yet not be accountable for the results.
- (c) When a manager is allowed to delegate even his obligation there will be no way of knowing who was accountable for what.

Thus, when authority is delegated, obligations are not passed down the organization; rather, new responsibilities are created at each level.

### **Parity of Authority and Responsibility**

Whenever authority is delegated, responsibility steps in and it coexists with the authority. A subordinate can be held accountable for the tasks assigned to him and the extent of authority delegated to him for their accomplishment. Accordingly, a sales manager cannot be held responsible for production failures for which he was given no authority. Hence, authority and responsibility should relate to the same assignment.

### **The Exception Principle**

Authority is delegated to push down the process of decision making as near the source of information and action as possible. The recipient of authority shall make proper use of it and make all the decisions falling within the scope of his authority. Only, in exceptional cases, when he cannot make the decision at his level should refer them upward for consideration and decision by the superior.

By delegating authority to a subordinate, a manager does not absolve himself of his responsibility. It is, therefore, essential that the manager should devise suitable techniques of control so as to ensure that the authority is properly used and results are achieved as expected.

Pooling together of the authority of two or more managers before a problem could be solved or a decision could be made is described as splintered authority.

### **Share Authority**

Where a superior comes and his subordinates come together for taking a decision, it is known as a shared authority.

### **Centralization versus Decentralization**

Staiger (1964) had suggested that certain things should not be decentralized, which he has listed as under:

1. The responsibility for objective determination
2. The responsibility for determination of overall comprehensive business planning and policy
3. The final responsibility for business control, i.e., control will be reserved at the top
4. The responsibility for quality design and quality standards
5. Final approval of the budget and other financial plan
6. The decision on manner of raising of capital and its application
7. The responsibility for deciding various capital projects like large scale, long-term commitment of the financial project.

However, with the emergence of participative approach, some of the Staiger's observations do not hold good in today's competitive business environment. To take an example, to ensure an enhanced commitment to deliver the desired results, objective determination, nowadays is more participative or a distributed decision making, rather than a centralized decision at the top.

### Criteria for Decentralization or Measurement or the Degree of the Decentralization

Earnest Dale (1965) through his research had listed following criteria for decentralization:

#### Number of Decisions

The greater the number of decisions made lower down the management hierarchy, the more is the decentralization.

#### Importance and Significance of the Decision

The more important and costlier the decision made lower down the management hierarchy, the more is the degree of decentralization.

#### Effects of Decision

The more the functions and the importance of organizational structure are affected by the decisions made at the lower levels, the greater will be the degree of decentralization.

#### Checking of Decisions

Dale's theory states about that where the lesser checking is required on decisions made lower down the management hierarchy, the more is the decentralization.

### Decentralization is the Greatest Where No Change Has To Be Made

In a static or linear environment of business, where economic upsurges or downsurges are not very visible, decentralization can be made with ease.

W. Newman (1951) had determined the degrees of decentralization, which are stated as follows:

1. If there is a complete reservation of authority, i.e., a total absence of decentralization, it will be called a total case of centralization.

2. If plans, policies and decisions are made at the top, then there will be the lesser degree of decentralization.
3. If there is a full authority for operating decisions at the lower levels and practically, there is no reservation or limitation, then it is a good amount of decentralization. We cannot call it a total decentralization.
4. If plans, policies and authorities, etc., are pushed down at the lower levels, then the organization will be known as bottom-up organization.

### Is Decentralization Important?

Despite different observations about decentralization, as has been pointed out earlier, organizations may be required to decentralize or distribute authority in certain circumstances. Even though theoretically arguments differ, there are many authors who appreciate the need for decentralization.

According to Louis A. Allen (1958), the need for decentralization arises in the following lines:

- To reduce or ease the burden of the top executives
- To provide opportunities for greater diversification of product lines
- To pay special attention towards particular product line or product market
- To promote development of future managerial potential for business
- To promote modification and morale of all members of the organization
- To keep pace with the technological development, e.g., electronics industries, requirement for decentralization is more, because it is growing rapidly.

### Advantages of Decentralization

- It reduces the burden of top executives
- It motivates subordinates towards better initiative and responsibility for higher performance
- It develops the morale of the employees
- It increases the chance of development of managerial potential
- It ensures product line diversification
- It ensures division of work
- It establishes better coordination and operation
- It ensures effective control, i.e., profit-centre decentralization
- It ensures quicker decision, i.e., decentralization helps in the attainment of MBO, i.e., management by objective.

### Limitations of the Decentralization

- Excessive operational cost
- Lack of divisibility
- Non-availability of good executives
- Wastage of staff service

- Difficulties in policy control—different decentralized units may adopt differences in the policy approach and thereby difficulties in policy control may be effected
- Obstacles in case of emergency—in emergency situations, the problem that usually occurs is the difficulty in getting a quicker decision from the central office
- There is a potential loss of control.

### How to Overcome the Obstacles that Stand on the Way to Decentralization

Achieving decentralization is not easy in organizations. Executives and subordinates are always at war on decentralization issues. Even in some organizations, subordinates allege that by decentralization, the management wants to get their part of job done through the subordinates. Some executives also believe decentralization will only add to their woes, since, some subordinates always need to be guided, which will reduce their effective time available for other managerial work.

The main reasons that become obstacles in the way to decentralization are given in the following:

1. Executives are unwilling to delegate and nurture self-sycophant attitude like 'I can better do it myself.'
2. There are some people who are pathologically not made to direct others. Some superiors think that their subordinates lack the ability and thus, do not delegate authority to them.
3. Some superiors have a total lack of confidence and faith on their subordinates. Here, the clear remedy is training of the subordinate or bringing new subordinates. Sometimes, a superior may feel the fear of losing control over his subordinates, if once some of his authority is delegated to them.
4. Executives may be handicapped by temperamental aversion of taking a chance, notwithstanding the clarity of delegation. The greater the number of subordinates, the higher the degree of chance of decentralization and also the higher degree of troubles. To delegate is to take a calculated risk.

The above five problems can be addressed through attitudinal change or modification. We must ascertain why the executives are reluctant to delegate. Sometimes, superiors give orders to the subordinate and subordinates show their reluctance to take responsibility. The reason behind this kind of attitude, again, can be attributed to reasons like:

1. Some employees lack of faith on themselves and always depend on others. They want to refer back the work to the superior. These types of people always have a tendency to avoid taking up of responsibility.
2. Some employees have fear of criticism. Much depends on this kind of attitude. They always feel that if something goes wrong, the superior might criticize them publicly. Sometimes, superiors might do negative criticism, which the subordinates not only resent but even react to it.
3. Some subordinates lack necessary information and resources for which they refuse to take up new responsibilities.

4. Subordinates, at times, avoid taking up responsibility due to work overload
5. Sometimes there is a lack of adequate positive incentive and inducement, for which employees refuse to take up new responsibilities.

The most important thing that the enthusiasts of decentralization have to remember is that application of decentralization requires social and administrative adjustment of attitudes and behaviour pattern of specific individual. In a dynamic society, such adjustments are common of occurrence. We feel this adjustment can take place keeping in view that each individual behaves differently. The best plan will not come until and unless personal adjustments are made. It is a behavioural outlook.

### Line and Staff Relations

Whatever may be the way of structuring an organization; basically organizations are tightly knotted together by the cord of authority relationships. Such relationships act as a cohesive force and integrate the whole organization. Types and degree of authority vary with the decision-making levels. Different authority relationships basically revolve around line and staff relationships. Line functions are those that have direct influence to accomplish objectives of an organization, whereas, staff functions help the line to work effectively to accomplish organizational objectives. However, in reality, it is difficult for us to separate direct and supportive functions. In fact, depending on the nature of the organization, such categorizations of line and staff functions vary. In a manufacturing organization, productions and sales are considered as line functions, whereas, finance, purchase, personnel, maintenance, quality control, etc., are considered as staff functions. Line and staff are defined on the basis of two viewpoints—functional viewpoint and authority relationships view point. Allen defined line and staff as follows:

'Line functions are those which have direct responsibility for accomplishing the objectives of the enterprise and staff refers to those elements of the organizations that help the line to work more effectively in accomplishing the primary objectives of the enterprise.' Since organizational objectives determine the line and staff functions, any change in objectives, may result in changes in the line and staff functions. The principal distinctions between line and staff may be made as under:

Line and Staff Distinction

Line Authority	Staff Authority
Line manager is a generalist	A staff manager is a myopic
Line managers direct others	Staff managers assist others
Line managers delegate authority	Staff managers serve authority
Line managers train subordinates	Staff managers investigate the problem
Line managers use sanctions	Staff managers solve special problem
Line managers exert control over subordinates	Staff managers make plans

(Continued)

Line Authority	Staff Authority
Line managers have veto power	Staff managers support the line
Line managers take operating decisions	Staff managers provide ideas to line
Line managers have the final responsibility	Staff managers have the special expertise

### Line and Staff Conflicts

Line and staff managers are supposed to work harmoniously to achieve any organizational goals. But their relationship is one of the major sources of conflict in most of the organizations. Since such conflicts lead to loss of both time and organizational effectiveness, it is always desirable to identify sources of such conflict and initiate necessary action to overcome the same. Theoretically, it is impossible to differentiate line and staff functions and because of the same, conflicts cannot be avoided. However, line and staff conflicts can be grouped into three categories—conflicts due to the viewpoint of line, conflicts due to the viewpoint of staff and conflicts due to the nature of line and staff relationships.

#### Conflicts Due to Line Viewpoint

1. **Lack of Accountability:** Line managers generally perceive that staff managers are not accountable of their actions. They feel that such lack of accountability on the part of staff causes them to ignore over all organizational objectives. Staff takes the credit for achieving the results, which actually line achieves. However, if anything goes wrong the staff blames the line. Such perception of line is one of the most important sources of line and staff conflict.
2. **Encroachment on Line Authority:** Line managers often allege that staff encroaches their authority by giving recommendations on matters that come within purview of the line managers. Such encroachments influence the system of working of their department and often leads to hostility, resentment and reluctance to accept staff recommendations.
3. **Dilution of Authority:** Staff often dilutes the authority and belittles the responsibility of line. Line fears that their responsibility may be reduced and they suffer from a sense of insecurity.
4. **Theoretical Basis:** Staff managers being specialists—generally think within the ambit of their specialization. They fail to relate their suggestions with the actual reality and are unable to understand the actual dimension of the problem. This is because staff is cut-off from the day-to-day operations. This results to impractical suggestions, making it difficult to achieve organizational goals.

#### Conflicts Due to Staff Viewpoint

1. **Lack of Proper Use of Staff:** Staff alleges that line managers often take decisions without any input from the staff. Line just informs staff only after taking decisions. This makes staff managers feel that line does not

want to make use of inputs from staff. However, in that case if anything goes wrong, staff would be made responsible. This often leads to major conflicts between staff and line.

2. **Resistance to New Ideas:** Line managers resist new ideas as they feel implementing new things means something wrong with the present way of doing work. Such rigidity of line managers dissuades staff to implement new things in the organization and it adds to their frustration.
3. **Lack of Proper Authority:** Staff often alleges that despite having the best of solutions to the problems in their areas of specialization, they fail to contribute to organizational goals persuading line to implement those, due to lack of their authority.

#### Conflicts Due to the Very Nature of Line and Staff Relationships

1. **Different Backgrounds:** Line and staff people are usually from different backgrounds. Normally line people are seniors to staff in terms of organizational hierarchy and levels. On the contrary, staff people are relatively young and better educated. Staff often looks down to the line. Such complex attitudinal problem creates an atmosphere of mistrust and hatred between line and staff.
2. **Lack of Demarcation between Line and Staff Authority:** In practice, it is difficult to make a distinction between line and staff authority. Overlapping and duplication of work create a gap between authority and responsibility of line and staff. Each tries to pass on the blame to the other.
3. **Lack of Proper Understanding of Authority:** Failure to understand authority causes misunderstandings between line and staff. This leads to encroachment and eventually, creates conflict.

To overcome line and staff conflicts, it is necessary for an organization to follow approaches that are given below:

1. **Clarity in Relationships:** Duties and responsibility of both line and staff should be clearly laid down. Relationships of staff with the line and their scope of authority need to be clearly defined. Similarly, for line managers, they should be made responsible for the decisions they make and they should have corresponding authority for the same. Line should enjoy the freedom to modify, accept or reject the recommendations or advice of the staff.
2. **Proper Use of Staff:** Line managers must know how to maximize organizational effectiveness by optimizing the expertise of staff managers. They are required to be trained on the same. Similarly, staff managers should also help the line to understand how they can help the line to improve their activities.
3. **Completed Staff Work:** Completed staff work denotes careful study of the problem, identifying possible alternatives for the problem and providing recommendations based on the compiled facts. This will result to more staff work and also result to pragmatic suggestions.
4. **Holding Staff Accountable for Results:** Once staff members become accountable, they would be cautious about their recommendations.

initiative and enjoys hardly any feeling of belongingness. Hence, employees may be less enthusiastic in their jobs.

Finally, narrow spans also reduce opportunities for the development of management. Too many levels hardly allow for delegation of any real authority and greatly limit the supervision to a very few activities at lower levels. The result is that the subordinate is deprived of the benefit of managing a larger number of related activities.

However, besides these limitations, the tall structure has certain advantages too, such as, reinforcing the authority relationships through emphasis given to status, placing burden on cross communication, which sometimes becomes problem but provide opportunity for promotion because of many positions.

Wide span or flat structure, on the other hand, calls for supervision of too many people by a single manager. Supervision becomes less effective because the manager does not have the sufficient time and energy to attend to each of his subordinates. The large number of contacts may also distract him to the extent of neglecting important questions of policy.

However, the wide span has certain advantages too. The communication chain is shorter, and it is free from hierarchical control. Subordinates feel more autonomy and develop independent spirit. The flat structure also reduces cost, as it requires less number of executives.

The factors responsible for the wide span may be identified as:

- (i) the trend towards decentralization
- (ii) improved communication technology
- (iii) increasing size of organizations
- (iv) the new pattern of leadership evolving from a growing acceptance of group process

While deciding span, advantages and disadvantages of these two situations should be carefully examined in terms of tangible, as well as, intangible factors, and the actual span should be determined keeping in view all the pertinent factors in a particular situation and at a given time.

### **Factors Determining Span**

The determination of span depends upon the number of relationships, which can be managed by a superior. Usually, the important determinant is the manager's ability to reduce the frequency and time impact of superior-subordinate relationships, though this ability itself is determined by several other factors. Factors, which determine the optimum span, may be stated as follows:

#### **Ability of Executives**

The supervisory ability of executives is composed of the capacity to comprehend problems quickly, to get along well with people and to command respect and loyalty from subordinates. In addition, the communicative skill, decision making, leadership ability and controlling power are important determinants of the supervisory ability. Accordingly, executives differ from one another in their ability to supervise others. When the ability is high, a large number of subordinates can be supervised. In contrast, the poor ability results in limiting the span of supervision.

### **Capacity of Subordinates**

Efficient and trained subordinates can discharge their duties satisfactorily without much help and direction from the superior. In such a case, the span may be larger because a superior will be required to devote less time in managing them. Similarly, changes in subordinates make a span narrower.

### **Nature of Work**

When the work involves routine and repeated efforts or where the executive manages similar functions, the executive becomes well versed with jobs and can handle a larger number of subordinates. On the contrary, activities and functions, with a degree of variability and probably of more complex nature, increase interrelationships and consume more time of the executive to dispose them of. This type of case warrants a fewer number of persons to be handled by the supervisor.

### **Time Required to be Spent on Supervision**

Every manager spends part of his time in contacting/attending persons, in doing administrative job of planning and policy making and looking after some other processes. These functions are not directly related to the guidance of the subordinates. Hence, the span to a great extent varies on the availability of time for supervision.

### **Delegation of Authority**

Ambiguous or inadequate authority delegation consumes disproportionate time of the manager in counselling and guidance of the subordinates. Where subordinates are delegated with a clearly defined authority, sufficient to carry out the assigned duties provided they are trained enough, they would, considerably, reduce the time and attention of the senior, thus helping to increase the span of the executive.

### **Degree of Decentralization**

An executive operating under decentralized set up is relieved of much of the burden of making programmed decisions and can afford to supervise relatively a larger number of subordinates.

### **Use of Objective Standards**

Reviewing the performance of subordinates can either be done by personal observation or through the use of objective standards. In the latter case, a manager is saved of many time-consuming relationships and can concentrate on points of strategic importance, thus widening his span of supervision.

### **Territorial Continuity of Functions Supervised**

Where functions are geographically separated, supervision of components and personnel becomes more difficult and time consuming. The manager must spend considerable time in visiting the separate units and make use of more time-consuming formal means of communication. Geographic continuity of functions supervised by the manager, therefore, operates to reduce his span of control.

Line also would have confidence on staff recommendations, as staff is accountable for the results.

### SPAN OF MANAGEMENT

Span of management is the limitation on the number of subordinates who can be effectively supervised by a manager in the discharge of his management duties. The incapacity of human beings restricts the number of persons who can be managed effectively. Actual spans in business organization indicate that there is no one best number that can be universally applied, however, all management experts agree that there is a definite span limiting the number of subordinates who can be managed effectively by one executive.

#### Approaches Determining Ideal Span of Management

There are various approaches in determining the ideal span of management. They are:

##### Classical Approach

This approach has dealt with generalizations embodying specific number of subordinates for an effective span. Classicists have suggested span of upper and top level from three to seven or eight subordinates. However, recent operational approach has suggested that there are too many variables in management and no exact number can be fixed.

##### A.V. Graicunas' Theory on Superior-Subordinate Relationships (1933)

A.V. Graicunas, a French management consultant, analysed superior-subordinate relations and classified these relationships into three forms. His study was not based upon empirical observation, but rather upon theoretical projection by mathematics. His formula was based on the geometric increase in complexities of managing as the number of subordinates increased. Three types of superior-subordinate relationships as identified by him are:

##### Direct Single Relationships

Such relationships arise from the direct and individual contacts of the superior with his subordinates. Thus if 'A' as a superior has three subordinates X, Y, Z, there would be three direct single relationships.

##### Direct Group Relationships

Such relationships arise between the superior and his subordinates in all possible combinations. Thus, a superior may consult his subordinates with a second in attendance or with all his subordinates or with various combinations of them. Depending upon possible combinations, there would be nine relationships like X with Y, Y with Z, X with Y, Z and so on.

##### Cross Relationships

These are mutual relationships among subordinates necessary for working under a common superior, such as X and Y, Y and X. The two relationships are different

because, in the first case, Y consults X and in the second case, X consults Y, and in both cases, situations may be different. There are six cross relationships for the subordinates.

On the basis of analysis of the above relationships, Graicunas developed the following mathematical formula based on the geometric increase in the complexities of managing.

$$\text{Direct single relationships} = n$$

$$\text{Direct group relationships} = \frac{n}{2} (2^n - 1)$$

$$\text{Cross relationships} = n(n - 1)$$

$$\text{Total relationships} = \frac{n}{2} (2^n + n - 1)$$

Where n = number of subordinates

On the basis of above formula, possible relationships with variable number of subordinates rise very rapidly.

Where there are four subordinates under one superior, the number of relationships will be:

$$\frac{4}{2} (2^4 + 4 - 1) = 44$$

When the subordinates are increased to one, i.e., from 4 to 5, the number of relationships will be:

$$\frac{5}{2} (2^5 + 5 - 1) = 100$$

### Wide versus Narrow Spans

Span of management directly affects the number of levels in the organization. Wider spans of management lead to flat organization, whereas, narrow spans of management result in tall organizational structure.

A narrow span (tall organizational structure), which results in many levels in the organization, creates problems both in terms of cost and efficiency. First, the levels are very expensive because they require more supervisory staff, which leads to larger expenses in the form of executive remuneration. Expense is further increased on the account of additional subordinates for a larger number of managers. Hence, in both executive and operative level, the cost increases. Secondly, communication in a tall organization has several limitations. Communication through scalar chain has to travel various levels, which not only delays it to reach at appropriate points, but also gets distorted or sometimes missed absolutely. Thirdly, narrow span presents problems in coordination and control, as the top management is much away from the operatives, where the actual work is performed. Encouraging lower level managers to develop cross relationships, however, can eliminate this problem. Fourthly, narrow span also affects employee morale adversely. A subordinate who finds himself submerged at the bottom of the organization pyramid feels sensitive about the fact that he bears nothing from the top organization (leaderships). Due to such placement, he gets very few opportunities to develop self-reliance and

### Availability of Staff Assistance

When an organization is equipped with staff services, subordinates, as a result, gain much of their guidance on methods, schedules and personnel problems from staff experts and, thus, require fewer contacts with line managers. The manager normally gets involved when the staff fails to run the show. Thus, the provision of staff assistance helps the executives to supervise a large number of subordinates.

Allen has suggested consideration of following points to determine spans:

1. Diversity
2. Dispersion
3. Complexity
4. Volume
5. Attitude towards delegation

Additional factors, which determine span in an organization, can be listed as follows:

1. Training of the manager
2. Capacity and the mind-set of the subordinates
3. Dynamic and complex nature of activities
4. The degree to which objective standards are established
5. The extent of delegation and the clarity of delegation
6. Existence of a good communication system
7. Degree of decentralization

### OPEN SYSTEMS APPROACH IN ORGANIZATION

Systems theory has unearthed the process of understanding the complex world of systems. In organizations, systems theory is applied through systems analysis. It is done through systems thinking, which helps us to study the organization, its patterns, structures and events. Thus, systems thinking provides us with a broader perspective to identify the actual issues and its causes, more like a diagnostic tool and accordingly, facilitates the appropriate process of intervention to correct the organizational odds.

Based on the above discussions, we can list the systems principles as under:

- Organizational systems follow a pattern of events in a cycle.
- Each pattern of event indicates some specific phases, and at each phase the behaviour of the organization changes
- Systems interpret patterns and events in their organizations
- Systems seek balance with the environment of the organization
- When systems do not interact with their environment, it becomes limited
- A circular relationship exists between the overall system and its parts

Traditionally, an organization is viewed as a closed system. Closed system perspectives consider everything as deterministic; hence, according to closed systems approach, the organizational structure should be more or less fixed

depending on the preferences of a specific organization. However, in today's changing world, the open systems approach to organization is considered. Open systems approach has been characterized by importation of energy, throughput, output, cycles of events, negative entropy, information input, steady or dynamic homeostasis, differentiation, integration and coordination and equifinality. Such characteristics were actually emerged from the consideration of the organization as a living system. According to Louis E. Boone and David L. Kurtz (1992), cycle of events is a process in an organization that follows open systems, by which it receives inputs from the environment and then transforms them to generate outputs. Negative entropy represents the ability of the organization to autonomously repair itself and then survive and grow by importing resources from its environment and transforming them to outputs. Organizations, through steady or dynamic homeostasis, maintain equilibrium over a period of time. Through differentiation, organizations develop structures and also specialized functions. Equifinality principle of the organization follows open systems and achieves the objectives of the organization through several different courses of action.

Operational research or management science approach has emerged as a separate discipline from the systems percept of organization. It is an extension of systems analysis and systems engineering approach. Operational research conceptualizes the general pattern of conceiving, designing and implementing with some given specifications optimizing the resource utilization in efficient and effective manner. In the process, it also tries to reduce the negative side effects. Systems engineering approach encompasses technological, organizational and societal systems. It follows four different stages like, systems analysis, systems design, implementation and operation. At systems analysis stage, an organization defines the systems, identify different sub-systems and establish their interrelationships. At systems design stage, an organization builds the systems model, optimizing the resources. At the implementation stage, the final design is built, keeping in view various eventualities, which could cope with uncertainties. Finally, at the operation stage, supports are provided to continue with the designed systems documenting the activities involved, user manuals, training, etc. Thus, both systems analysis and systems engineering provide a general way of thinking about practical situations requiring the creation of a system that achieves some predefined purpose.

### SUMMARY

In this chapter we have discussed about basic issues of organizing activities. Success of an organization largely depends on the way it organizes its activities. While organizing, it is necessary to follow certain basic principles. It is also important that what may be applicable for an organization may not hold good for another. There are many forms of organizational structures—selecting an appropriate structure for an organization largely depends on the style of managerial activities and priorities. A manager has to study all facets of an organizational life before finalizing a structure. Structure sets the culture and often it creates an organizational climate. Hence, changing an existing structure requires a careful study of the problems. Quite often, changing strategies of an organization influence the organizational structure. Globalization has now intensified the competition for an organization. It has also led to various new issues.

which organizations worldwide now need to comply with. One major issue is market consolidation by mergers and acquisition. Cross-border mergers now lead to compliance with multicultural issues, diversity issues, corporate governance issues, etc. Even for business reasons, organizations are now required to achieve economy of scale, locating their manufacturing and back-office jobs in competitive wage cost countries. All these now require an organization to experiment with their structure and identify the best fit.

However, it is important to mention that despite globalization, global competition, deregulation, change of technology, new generation of the knowledge workers as organization's manpower, the knowledge about the fundamental concepts of organizational structure and design has become most important for managers, irrespective of their functional areas, as every manager has to organize his/her activities to get the best from their people. It is always desirable that organization's design is chosen based on the consideration of multidimensional aspects. In any organizational design, we have two primary contexts: structural and human. Structural context focuses on goals, strategy and structure, whereas, human context focuses on work processes, people, coordination and control and incentive mechanism. These two contexts together help an executive to design an organization from a more holistic perspective.

In this chapter, we have also discussed the systems view of organization and how the organizational structure relates to systems concept. Organization is defined as relations among all the components of a system. Organizational structure denotes the components and relations that bind people working with the organization. Systems are collections of parts (or sub-systems), which are integrated to accomplish an overall goal of an organization. Systems have inputs, processes, outputs and outcomes, with ongoing feedback among these various parts. If one part of the system is removed, the nature of the system is changed. Systems range from very simple to very complex. Social systems are comprised of numerous sub-systems, as well. These sub-systems are arranged in hierarchies and integrated to accomplish the overall goal of the overall system. Every organization effectively functions through an integrated interlocking network of sub-systems. Effective organizational design depends on the interrelationships of principles of job specialization, departmentalization, coordination and line and staff positions. It is defined as the total pattern of structural elements and patterns, which are used to manage the overall organization. Effective organizational design is instrumental for implementing organizational strategies for the achievement of organizational goals. Broadly, organizational design rests on two models—bureaucratic model and behavioural model. However, technology, environment, size and the organizational life cycle are the four important situational factors in organizational design.

### Key Words

**Three Pillars of Organization:** Three pillars of organization are people, organization itself and technology. People issues encompass education, training and attitudes. Organizational issues cover strategy, policy, culture and bureaucracy. Technological issues are hardware, software, telecommunications and information systems.

**Operations Research:** Operational research conceptualizes the general pattern of conceiving, designing, and implementing with some given specifications optimizing the resource utilization in efficient and effective manner. In the process, it also tries to reduce the negative side effects. Systems engineering approach encompasses technological, organizational and societal systems. It follows four different stages like, systems analysis, systems design, implementation and operation.

**Boundary Spanning:** The buffering role to account for the external organizational uncertainty.

**Diversity:** It is applicable for both the employees and the customers. Differences in culture, race, gender, age, etc., lead to diversity issues.

**Contingency Approach:** This approach helps to ensure goodness of fit between the prevailing organizational structure and the external environmental issues.

**Grapevine:** This is created in an informal organization. A productive grapevine benefits an organization while a nonproductive one may act as rumour monger.

**Strategic Business Unit:** Departmentalization of an organization based on the product line or product mix. In SBU, one business head, manages the activities independently. Each SBU's competitor groups are different.

### REVIEW QUESTIONS

1. What are the important sources of conflict between line and staff? How can such conflicts be reduced?
2. Describe the advantages and disadvantages of departmentalization by functions and departmentalization by products and services.
3. What is the important basis of departmentalization?
4. Define organizing. Explain the term organization. Differentiate between organization and organizational structure.
5. What are the essential elements of organizing?
6. Define span of management. Why it is so important for structuring an organization?
7. What is delegation? List out the major benefits of delegation of authority?
8. Explain the difference between delegation and decentralization. How can we decide the degree of decentralization?
9. Explain the meaning and scope of authority, responsibility and accountability.
10. Design an organizational chart for an integrated steel plant, who maintains a very thin corporate layer, whereas, at the operation level, maintains the presence of staff support along with the line. Also name your proposed organizational structure, justifying why you have selected such a structure?
11. A company has asked you to study their existing structure and reporting relationship. The company believes that since they are operating with the state of art technology and their core business is to extend technical support to telecom majors, there is no point to keep their brick and mortar organizational structure in all the countries of their operation. Rather, they prefer to follow a networked structure, with their controlling office in India. Suggest them the right course of action.

12. From a functional structure, if we want to switch over to matrix structure, what are the immediate problems that we are likely to face and how do we need to solve those problems?
13. Line and staff relationships are expected to support each other and work harmoniously so as to achieve organizational goals and objectives. However, conflicts between the two often crop up, which form the major source of friction in many organizations. What can be the main reasons for line and staff conflict? How can such a conflict be avoided? Do you believe that all core managerial functions should be aligned with line function?
14. Develop a strategy map for an organization of fast moving consumer goods (FMCG). Explain each part of the map with adequate logic assuming the company is a new player in Indian FMCG market, though they have strong presence in consumer durables, white goods, electronics, telecommunications, etc.
15. Explain a hypothetical matrix organizational structure of a multi-product organization, clearly showing the responsibility assigned to every head.
16. Explain the systems view of an organization. How does systems view influence the organizational structure and design?
17. Short Notes:
  - (a) Matrix Organization
  - (b) Hybrid Structure
  - (c) Strategic Business Units
  - (d) Wide vs Narrow Span
  - (e) Decentralization
  - (f) Departmentalization by Time
  - (g) Barriers to Delegation
  - (h) Formal and Informal Organizations
  - (i) Human Behaviour in Organizing
  - (j) Open Systems Approach
  - (k) Systems Theory in Organization

## REFERENCES

1. Chandler, Alfred D. 1962. *Strategy and Structure*. Massachusetts: MIT Press. MIT, Mass.
2. Dale, Ernest. 1965. *Readings in Management: Landmarks and New Frontiers*. McGraw-Hill, New York.
3. Graicunas, A.V. 1933. Relations in Organizations. *Bulletin of the International Management Institute*, 7 March, pp. 39-42.
4. Allen, Louis A., 1958. *Management and Organization*. New York: McGraw-Hill Education.
5. Boone, Louis E. and David L. Kurtz. 1992. *Management*. New York: McGraw-Hill Inc.
6. Burton, Richard M., Gerardine DeSanctis, and Borge Obel. 2006. *Organizational Design: A Step-by-Step Approach*. Cambridge: Cambridge University Press.
7. Sarasvathy, S. 2007. *Effectuation: The Logic of Entrepreneurial Expertise*. Cheltenham: Routledge.
8. Kanter, Rosabeth Moss. 2001. *Evolve! Succeeding in the Digital Culture of Tomorrow*. Boston: Harvard Business.
9. Bhattacharyya, D.K. 2009. *Organizational Behaviour*. New Delhi: Oxford University Press.

# 4

## Staffing in Organizations

### LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend the recruitment functions in organization
- understand the process of recruitment
- know about the interview process
- get familiar with the induction programme
- know about the placement of employees after recruitment

### INTRODUCTION

For staffing various positions in the organization, one needs to go for external hiring, as redeploying existing manpower through job restructuring may not be adequate. External hiring process succeeds the Human Resource Planning (HRP). Through HRP, one can understand the extent of external hiring after adjustment of internal manpower.

Recruitment, selection, induction and placement are important tools for procuring and effectively using human resources in an organization. All these together are known as staffing function. While recruitment involves employing suitably trained workforce, selection helps in choosing the right candidate for the right job. Induction is the process of introducing a new employee formally into the organization, whereas, placement is about putting the men to the right kind of jobs after recruitment. This chapter focuses on these four important organizational activities.

### RECRUITMENT

Recruitment functions in recent years have assumed the importance for its increasing emphasis on human resources. Traditional approach to personnel management was to ensure routine activities for the maintenance of human resources in the organizations. However recently, radical changes in human resource management have taken place. Nowadays, human resources are perceived to be as important as any other important resources (physical and financial) of an organization. This change in attitude towards

human resource has developed new areas for personnel management. The human resources are the people who are part of the organization. Broadly, they may be direct employees, the part-time persons, temporary employees or consultants or any person or persons with a variety of other relationships to the organization. Within the human resources area, there are two major activities. The first is concerned with recruitment, selection, placement, compensation and appraisal of the human resources. They are known as *human resources utilization functions* or *personnel functions*. The other functions are directed to work with the existing human resources, improving their efficiency and effectiveness. These are known as *human resources development (HRD) functions*, which are designed to enable existing human resources to learn activities for their effective functioning in the present jobs, future identifiable jobs and so also for future undefined jobs.

To increase the importance of human resources, it is now imperative for all organizations to retain the manpower and at the same time recruit and select the best possible talents in the country. Most of the organizations are now facing technological changes, resulting in radical change in the recruitment process. Such a technological change, inter alia, calls for hiring manpower having higher skills and knowledge, which were so far not available. However, when we consider the recruitment of manpower for unskilled jobs, there seem to be no apparent problem for the organization, as unskilled labour is abundantly available in our country for obvious high rate of unemployment. For high technology employees, i.e., mostly those who are in the managerial positions with professional skills, the recruitment function is more complex and dynamic.

### Definition

The term 'recruitment' may be defined as the process to discover sources of manpower to meet the requirements or the staffing schedule of an organization and to employ effective measures for attracting that manpower in adequate number to facilitate the selection of an efficient workforce.

### Functions

The first important task of recruitment cell is to frame a recruitment policy. Framing a recruitment policy calls for review of manpower requirement, i.e., it should be adequately supported by an effective manpower forecasting. Manpower planning and so also manpower forecasting of an organization depend on many important factors like the present nature of work, possible change in the future working of the organization, the manpower records and information available in the organization for the present strength, the diversification plans and programmes of the organization, the environmental change and the change necessary in the organization to respond to such environmental change, etc. Most of the organizations, in principle, believe in recruiting the best possible manpower from outside the organization. However, the recruitment policy of some organizations considers recruiting of the employees based on the recommendation of the present employees or recruiting employees from the wards of the existing employees.

To take an example, in Tata organization, there is a system to recruit employees for unskilled/low-skilled jobs, both technical and non-technical nature, from the wards of the existing employees. Such a policy of recruitment in Tata organization

has been accepted in principle and Tata, in their manufacturing units, maintains a separate employment exchange records to enlist the names and other details of the employees' wards to offer them employment as and when vacancy arises. However, such type of recruitment policy is not followed when hiring of manpower for managerial jobs is done. In such cases, companies are looking for the best available talents. Thus, the companies either give advertisements of the vacancies in leading newspapers of the country and even in good professional journals or they may go in for such recruitment by effecting campus interview or may also retain the services of recruitment consultants. Such recruitment consultants, having maintained a separate data bank for the prospective job seekers, can make available lists of prospective managerial manpower to such companies. In addition to the framing of recruitment policy, each organization for making their recruitment a scientific process of selection, carry out a regular forecasting of manpower recruitments.

### Internal Recruitment

In certain cases, organizations prefer to man their higher managerial vacancies internally from their existing employees. In those cases, organizations need to develop their existing manpower by adopting suitable training and development functions. Training and development may not necessarily always ensure the availability of the best talents internally. Organizations are then compelled to recruit from outside sources, mentioned before.

### Recruitment Policy

Sound recruitment policy calls for adopting scientific process of recruitment, i.e., those techniques, which are modern and scientific. Recruitment policy needs to be so framed, so that managerial turnover can be substantially reduced, as the cost of managerial turnover in terms replacement (new recruitment cost is very high). Without a suitable recruitment policy, it may not be possible for the company to select the right candidate for the right job. A sound recruitment policy, therefore, needs to:

- Identify, at the outset, the recruitment needs of the organization
- Identify the preferred sources of recruitment
- Frame suitable criteria for selection and finally
- Consider the cost of recruitment

### Recruitment Process

As has already been discussed, a particular organization may effect recruitment either from the internal sources, i.e., by promoting the existing employees for higher positions or they may go for outside sources. Thus internal and external sources of recruitment can either be resorted to by any organization, subject to the convenience and feasibility. Recruitment is an art of attracting applicants, from whom the most suitable ones may be selected in a particular job or jobs. Internal recruitment may often avoid the unpleasantness, but it is not necessarily effective because it does not allow the organization to get many alternatives to select the best available talent. The external sources, being open, give carried opportunities to

an organization to tap the best or suitable candidates from widely dispersed areas. The requisition for recruitment contains brief description of the post, qualification and experience required, etc. Such requisitions are normally signed by the head of the Human Resource Department. External sources of recruitment are explored, keeping in view the type of personnel required. The workmen may be recruited at the gate of the organization itself or from the employment exchange. Management trainees are taken from the institutes and universities through campus interview. Senior executives are attracted through advertisements in leading newspapers and magazines. The major sources of recruitment for different types of personnel, therefore, are as follows:

- Employment exchanges
- Consultants and private employment agencies
- Advertisements in periodicals and newspapers, radio and TV
- Deputation
- Universities and Management Institutes
- From the source of existing employees
- Trade unions
- Internet/job site, etc.

The employment exchanges maintain a register of candidates seeking various types of job. Under Compulsory Notification of Vacancies Act, 1955, the employers are required to notify certain types of vacancies to the nearest employment exchange and recruit candidates from among the applicants registered with them. The skilled and unskilled workers and the clerical staff are mostly recruited through these employment exchanges. Private consultants and agencies assist organizations in locating technical and managerial staff. They charge prescribed fees for their services to the organization.

Advertising in newspapers and magazines, radio and TVs, are one of the most effective sources for attracting the prospective candidates. It also helps in building the image for the organization because through such advertisements, the organization makes available certain information, like their product, their market share, their turnover value, etc., to the public in general and target consumers in particular. Since written press insertions or verbal advertisements through audio and audio-visual methods give the first-hand information to the prospective jobseekers, each organization is required to give as much factual information as possible regarding the expectations from the candidates, their age groups, qualifications and experience, salary and perks attached to the positions and important conditions of service, the time limit and mode of applying, etc. There are some agencies that help organizations in drafting, publishing and broadcasting these advertisements.

Deputationists are mainly appointed in public sector undertakings. The civil servants are often deputed for many senior and mid-level positions for a specified time.

Recruitment from universities and management institutes are effected through campus interview. Almost all good private organizations select their management trainees through such method. Some organizations even support the academic ambition of prospective students by sponsoring their courses. Here, the organization

and the prospective student sign a bond that the latter would join the organization after the completion of the course.

Some organizations recruit from the source of existing employees to ensure commitment and loyalty and, at the same time, to motivate the employees. Such type of recruitment, however, is restricted only to the clerical and unskilled jobs in most of the cases.

Trade unions also recommend candidates for clerical and unskilled jobs. This practice is not in vogue in many organizations. Only in technical training schemes, trade unions are found to influence the organizations to induct their recommended candidates as apprentices.

Recruitment through Internet/job sites also has now become very popular for its wide reach to focused jobseekers, immediacy and cost effectiveness. Due to its global reach, organizations also get the flexibility to attract the best talent. Many placement agents have now started this service to increase their business volume.

The next step in selection procedure is to personify such attributes in candidates, i.e., developing certain specifications for the desired candidate. It means defining the desired background as education, training, personality and characteristics of the candidates applying for the vacancy position. This, in reality, is an exercise to pre-portray an ideal candidate for a job.

### Preliminary Screening of Applicants

The number of applications normally received against any advertised vacancy is usually large. This creates a problem of selecting the right persons from many candidates. Moreover, conducting tests and interviews for all the candidates may not be always feasible and, at the same time, cost efficient. To obviate such problems, most of the organizations first do a preliminary screening to sort out unsuitable candidates before going ahead with the selection process. There are many different ways of doing such preliminary screening. Some organizations conduct short tests for all the applicants, while the best method may be the checking of *Application Blank*. Each organization before going for the selection process develops their own standards or potential attributes for the prospective candidates. This helps them also to define the reasons for rejecting certain candidates. To take an example, for the post of a Stenographer, a particular organization may define their rejection standards as below:

1. Those who are having shorthand speed below 100 words per minute and typing speed below 40 words per minutes
2. Those who are not having any work experience
3. Those who are above thirty-five years of age

By checking 'Application Blank' of the candidates, an organization may reject a good number of applicants based on the above rejection parameters. All the above processes, therefore, enable an organization to shortlist the candidates before going ahead with the subsequent stages of selection. The rejection standards, like the ones stated above, may also be mentioned in the advertisement itself so that the number of applicants is minimized.

Some organizations also adopt *successive hurdles technique* as an effective screening process. This technique calls for arranging all selection factors in order of

importance. To take an example, if for a particular post, aptitude test is considered the most important, the first step should be to test the aptitude of the candidates. Then the other successive tests of qualification, job experience, personality, etc., may be conducted provided the candidates qualify these hurdles one by one.

### Review of Application Blanks

The application blank form is designed to have detailed information about the applicants. Some organizations have their own printed application blank, whereas, others ask the candidates to give their particulars in a standard format to elicit information like:

- (a) Personal data and biographical information, i.e., name, address, telephone number, age, sex, marital status, children, nationality, education (school, college, university attended, degree/diploma passed, year of passing, subjects, grade or division obtained, etc.) professional qualification and membership of professional bodies, language known (ability to read, write and speak), etc.
- (b) Chronological employment history for all jobs (with joining and leaving dates in each case of change in the employees), employer's name, address and nature of business positions held and duties, reason for leaving (if any)
- (c) Personal circumstances, i.e., when required can he/she relocate anywhere or not
- (d) Medical history, brief details of any serious illness, number of days not present during last few years (in case, the applicant served earlier somewhere) on medical grounds, record of hospitalization (if any), declaration of any disability, major operation, etc.
- (e) Interest, hobbies, sports and other activities
- (f) Anything else which the applicant may like to add in support of his candidature

Several other items may be included in the application blank with regard to the specific requirements of the organization and the job.

Weighted application blanks are also prepared by some organizations to record personal history items associated with the job success of the candidates. For each item of the application blank, weight factors are predetermined. Importance of weight factors for different jobs varies. To take an example, for a job for unskilled labourers, education may be given less weight, whereas, for executive positions, education receives higher weightage. Application blanks, therefore, help in comparing the applications of different candidates.

### Reference Checking

Some organizations ask for references from the applicants in application blank itself to get information on candidate's character and background. Such references are preferred from people, other than blood relations, who have some acquaintance with the candidates. They can be earlier employers and teachers or other authorities from schools/colleges/universities, where the prospective employees studied. Organizations try to verify candidates' background from the

references either over phone, through correspondence or through personal visits. Most of the organizations send a brief questionnaire to such references along with a confidential note, requesting them to furnish such details.

### Psychological Testing

Generally, psychological testing can be used for various purposes like determining training needs and evaluation of training programmes, selection and placement, transfer or promotion and counseling. However, in an organization such testing is primarily used for selection and placement. Such tests are of different types like, group or individual test, instrumental tests, aptitude or achievements tests, personality and interest tests, etc. *Group tests* are designed to test a group of candidates simultaneously. *Individual tests* are for individual candidates at a particular point of time. *Instrumental tests* can be either group tests or individual tests. When it is an individual test, it makes use of different tools to study individual candidate's familiarity and skills. However, in case of its application for a group, it involves written test to study the written responses of the candidates. Aptitude tests are intended to assess the potentiality of the applicants to learn the job, whereas, achievement tests enable us to assess how effectively an individual can perform his job. Conventionally, aptitude tests are administered on freshers, i.e., those who do not have any past job experience, whereas, achievement tests are intended for experienced candidates, which have bearing on the previous job performance of the candidates. For marketing jobs and managerial and executive positions, such tests have much relevance. However, psychological tests are mostly designed to measure the aptitude and skills of successful job performers. For selection and placement, the most of the organizations retain the services of consultants and experts rather than just relying on psychological testing. This minimizes the chance of error in selecting the wrong candidates for different job positions. Since, psychological testing is a complex method and it has wide divergence, we have briefly introduced the concept of attitude measurement with simple examples and illustrations together with some conceptual details about different types of measurement and scales.

### Scaling Techniques for Attitudinal Mapping

Developing a proper scale helps us to measure the attitude of newly recruited employees. Each scale has unique properties. Some scales can only establish an association between variables and limited in their mathematical properties. Other scales have more extensive mathematical properties, and some can also hold out the possibility of establishing cause-and-effect relationships between variables.

### Levels of Measurement

There are four levels of measurement. These are nominal, ordinal, interval and ratio.

**Nominal Scale:** This scale classifies individuals, companies, products, brands or other entities into categories without any order. This is why this scale is often referred to as a categorical scale. This scale simply counts the frequency of the cases assigned to the various categories.

An example of a nominal scale

Which of the following FMCG products you buy at least once in a month? (Please tick)

Toothpaste ☐ Shampoo ☐ Soap ☐  
Deodorant ☐ Hair oil ☐ Detergent ☐

These numbers have no arithmetic properties and the only measure is the mode. This is because, using this scale we simply try to get a set of frequency counts. Testing of hypothesis can be done based on these data in the nominal form.

**Ordinal Scales:** Ordinal scales involve ranking along the continuum of the characteristic being scaled. To take an example, we may ask the respondents to rank some brands of shampoo in order of their preferences.

An example of an ordinal scale

Order of preference	Brand
1	Sun Silk
2	Rejoice
3	Head & Shoulder
4	Clinic Plus
5	Pantene

This table gives the researcher the order of preference but do not provide any information about how much more one brand is preferred to another. This is what we call interval between any two brands. In addition to the information that are made available through a nominal scale, using ordinal scale we can compute the median, quartile and percentile. We can also compute the rank correlation coefficient (commonly known as Spearman's rank correlation) and Kendall's coefficient of concordance.

**Interval Scales:** The interval or cardinal scale has equal units of measurement which makes it possible to interpret not only the order of scale scores but also the distance between them. However, it must be recognized that the zero point on an interval scale is arbitrary and is not a true zero. This of course has implications for the type of data manipulation and analysis. Interval scales may be either numeric or semantic.

Examples of interval scales in numeric and semantic formats

Please indicate your views on Sun Silk by scoring them on a scale of 5 down to 1 (i.e. 5 = Excellent; 1 = Poor) on each of the criteria listed

Sun Silk is: Circle the appropriate score on each line

Soft	5	4	3	2	1
------	---	---	---	---	---

(Continued)

Please indicate your views on Sun Silk by scoring them on a scale of 5 down to 1 (i.e. 5 = Excellent; 1 = Poor) on each of the criteria listed

Sun Silk is:

Circle the appropriate score on each line

Nourishing	5	4	3	2	1
Leaves the hair silky	5	4	3	2	1
Anti-dandruff properties	5	4	3	2	1
Reasonably priced	5	4	3	2	1

Or

Please indicate your views on Sun Silk by ticking the appropriate responses below:

	Excellent	Very Good	Good	Fair	Poor
Soft					
Nourishing					
Leaves the hair silky					
Anti-dandruff properties					
Reasonably priced					

**Ratio Scales:** The highest level of measurement is a ratio scale. This scale has the properties of an interval scale together with a fixed origin or zero point. Examples of variables, which are ratio scaled, include weights, lengths and time. Ratio scales permit the researcher to compare both differences in scores and the relative magnitude of scores. For instance, the difference between five and ten minutes is the same as that between ten and fifteen minutes, and ten minutes is twice as long as five minutes.

#### Measurement Scales

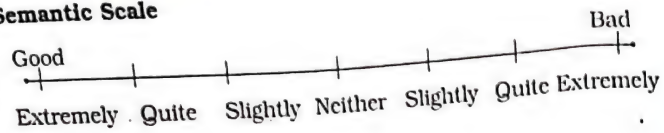
The various types of scales used in attitude mapping fall into two broad categories: comparative and non-comparative. In comparative scaling, the respondent is asked to compare one brand or product against another. With non-comparative scaling, respondents need to only evaluate a single product or brand. Non-comparative scaling is frequently referred to as monadic scaling, and this is the more widely used type of scale in commercial marketing research studies.

Different other types of scale are given as follows:

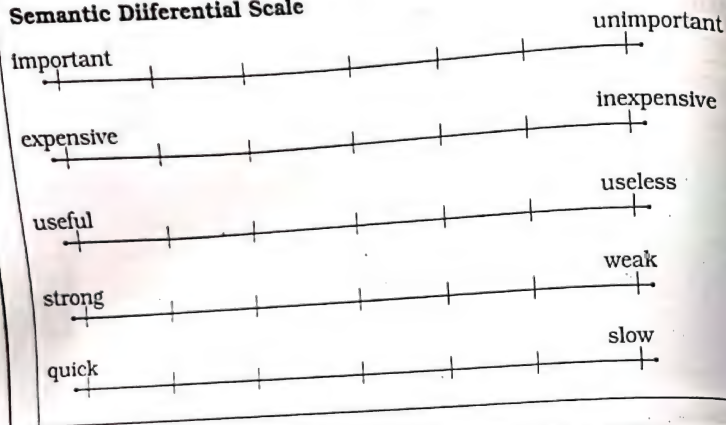
**Semantic Scales:** This type of scale makes extensive use of words rather than numbers. Respondents describe their feelings about the products or brands on scales with semantic labels. When bipolar adjectives are used at the end points of the scales, these are termed semantic differential scales. The semantic scale and the semantic differential scale are illustrated in the following page:

## Semantic and Semantic Differential Scales

## Semantic Scale



## Semantic Differential Scale



**Likert Scales:** A Likert scale is what is termed a summated instrument scale. This means that the items making up a Likert scale are summed to produce a total score. In fact, a Likert scale is a composite of itemized scales. Typically, each scale item will have five categories, with scale values ranging from -2 to +2 with 0 as neutral responses.

## The Likert Scale

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
If the price of raw materials fell firms would reduce the price of their food products.	1	2	3	4	5
Without government regulation the firms would exploit the consumer.	1	2	3	4	5

(Continued)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Most food companies are so concerned about making profits that they do not care about quality.	1	2	3	4	5
The food industry spends a great deal of money making sure that its manufacturing is hygienic.	1	2	3	4	5
Food companies should charge the same price for their products throughout the country.	1	2	3	4	5

The scales, which have been described in this chapter, are among the most commonly used in attitude mapping for recruitment. There are many more forms of scales. However, familiarity with the scales mentioned here can enable a manager to deal with such scales and successfully conduct the research studies.

## Attitude Measurement

Attitude is a mental state of an individual which tends to act or respond or is ready to respond for or against objects, situation, etc., with which his/her vested feeling or affect, interest, liking, desire and so on, are directly or indirectly linked or associated. During the course of development, a person acquires tendencies to respond to objects. These learned cognitive mechanisms are called attitudes. Changes in knowledge are followed by change in attitudes. Attitudes are different from knowledge in a sense that attitudes are emotion laden. Knowledge reinforces attitudes and reinforced attitudes, in the long run, reinforce individual and group behaviour. Hence, attitude is neither behaviour nor a cause of behaviour, but it relates to an intervening predisposition or a frame of reference, which influences the behaviour of an individual.

When the interest, feeling, etc., of an individual is not connected in any way with an object or a situation, his/her responses towards the said object or situation will then not be attitude but opinion.

Attitudes or psychic state cannot be observed because psychological variables are dormant or latent. Due to this reason, attitude measurement is quite difficult. Inference, prediction from behaviour data, interviews with structured questionnaires and scales are the usual tools for attitudinal measurement.

Popular methods of measuring attitudes are:

- Thurstone scales
- Likert scales
- Semantic differentials

It is our basic assumption that a person's attitude can be measured by asking questions about thoughts, feelings, and likely actions toward the attitude object.

Attitudes can also be measured by a quantitative technique, i.e., each person's opinion can be represented by a numerical score. A particular test item, or other behaviour indicating an attitude, has the same meaning for all respondents, so that a given response is scored identically for everyone making it. In a typical attitude questionnaire respondents are asked to indicate whether they agree or disagree with each of a series of belief statements about an attitude object. Attitudes are arranged along an evaluative continuum ranging from favourable to unfavourable. Why not just one belief statement? In most cases, one question will simply not address all the likely domains of an attitude, e.g., Cannabis causes as much damage to your health as tobacco. Using only one question significantly increases the likelihood that irrelevant factors, such as the wording of the question, will create errors. If responses are summed over a number of questions, then it is a more valid measure because the error associated with individual items tends to cancel out over a number of items. Each attitude statement should represent a different and independent view about the attitude object and should cover both favourable and unfavourable attitudes, so that the nature of the response to one item should not affect the response to another item.

**Thurstone Scales:** It is the first major technique of attitude measurement. Its basic assumptions are:

- Attitudes lie along an evaluative continuum ranging from favourable to unfavourable
- Ordering of attitude statements should be such that there appeared to be an equal distance between adjacent statements on the continuum, i.e., judgements can be made about the degree of discrepancy among different people's attitudes

**Assumption of equal distance but actually equal appearing Thurstone scales—method (1)**

- Initially, construct item pool, i.e., Item pool—large amounts of statements with opinions about an issue.
- Assemble group of 'judges' (100–150 statements, 40–60 judges)
- Hypothetical scale running from most favourable through a neutral point to the least favourable
- Judges consider each item and sort into piles (categories), usually eleven. Intervals between categories should be regarded as subjectively equal

**Thurstone scales—method (2)**

- Statements selected for use in the final scale are those that have high inter-judge agreement (low spread) and are at relatively equally spaced intervals along the continuum
- Have a desired number of items for final scale, say, twenty. Twenty scale values should be evenly spread across the continuum
- Respondents score the scale value of each item agreed upon
- Respondents should agree with very few items (perhaps two or three)

**Example of scoring—Issue equal opportunities**

- Women are less reliable employees because they are likely to leave their jobs for family compulsions (2.1)

- Interview panels should scrutinize all questions before interview, to ensure none are discriminating (5.8)
- Companies should provide more crèche facilities (8.7)

**Likert Scales:** Instead of judges, respondents place themselves on an attitude continuum, like:

Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
1	2	3	4	5

Person's score can be summed and the resulting total used as an index of that person's attitude.

**Semantic Differential:** Focuses on the meaning people give to a word or concept. Words have two meanings:

- Semantic or dictionary meaning
- Connotative meaning (meaning a word suggests apart from the thing it explicitly denotes or names).

**Assumption**

Hypothetical semantic space of an unknown number of dimensions, in which the meaning of any word or concepts can be represented at a particular point.

Three major dimensions are:

- Evaluation (how good?) (e.g., healthy/unhealthy)
- Potency (how powerful?) (e.g., weak/strong)
- Activity (how active?) (e.g., static/dynamic)
- Midpoint of neutrality
- Social representations
- Social construction—

Ideas and opinions which we hold are moulded by what other people believe and say 'Our reactions to events, our responses to stimuli, are related to a given definition, common to all the members of the community in which we belong' (Moscovici, 1983), i.e., similarity of group members and difference (individuality) of group members. If social representations are cognitive structures shared on a group basis, the agreement between members of that group should increase with age (e.g., Augoustinos, 1991)

**Other measures of attitudes are given as follows:**

1. Physiological
  - Skin resistance (Rankin & Campbell, 1955)
  - Heart rate (Westle & DeFleur, 1959)
  - Pupil dilation (Hess, 1965), i.e., attitude inferred by comparing participant's response in the presence of a neutral object and the presence of the attitude object
2. Overt behaviour
  - Physiological measures of attitudes; problems;
  - Indicate intensity and not direction

- Physiological measures sensitive to variables other than attitudes (Caccioppo & Petty, 1981), e.g., vigilance tasks lower the heart rate. E.g., skin response changes in presence of novel or incongruous stimuli
- Sensitive issues—Bogus pipeline technique (Jones & Sigall, 1971)

Method of overcoming social desirability bias:

- 'Machine', which participants are told, can measure strength and directions of people's emotional responses, i.e., participants are less likely to conceal socially undesirable attitudes (e.g., Allen, 1975).

Reliability and validity of Likert scales and Thurstone scales: Likert scales are generally more reliable than Thurstone scales. Validity remains a contested issue, i.e., what is being measured as an attitude? Critics would say that demand characteristics are the ones that are actually being measured as attitude. Measuring attitudes and their relationships to behaviour is a complex and subtle business, e.g., Glick & Fiske (1996).

Problems with attitude measurement:

- Definition of attitude
- Lack of common methods of measurement
- Operationalization of outcome measures

**Attitude Survey:** To recruit a new incumbent and to evaluate the human relation in the factories, industries and different organizations, attitude survey is indispensable. The study of attitude is also important in designing a training programme, which is a core HRD function. Attitude surveys focus on feelings and motives of the employees' opinions about their working environments. There are three basic purposes for conducting attitude surveys:

- To compare results with other survey results
- To measure the effect of change that occurs
- To determine the nature and extent of employee feelings regarding specific organizational issues and the organization in general

Usually, attitude surveys are carried out by interviewing a person with a structured close-ended questionnaire. The skill of the interviewer is all important here for the correct measurement of attitude. While framing the questionnaire the interviewer should be cautious, as simple opinion-laden questionnaire items will not depict the attitude of the interviewee. It is important to put value-laden questionnaire items and to use behaviourally anchored statements, asking the respondents to rank any myth statements, etc. A sample list of such myth statements and value-laden questionnaire items are given below:

**Myth Statements:**

1. Hard work ensures better result
2. Linking to work with subordinates for prompt results
3. Never say no to anyone; listen to everybody's problems
4. One, who is indispensable, is efficient
5. Maintain the hierarchical structure while taking decisions, very rigidly

### Sample Questionnaire Items for Attitude Measurement:

1. Do you think the expenditure on training is wasteful? (Give your answer selecting any one from the given alternatives).
  - (a) To a large extent
  - (b) To some extent
  - (c) To a very little extent
  - (d) Not at all
2. What, to your knowledge, are the major barriers to effective implementation of flexible working hours in India? Please arrange the factors in order of your perceived preference.
  - (a) Lack of awareness
  - (b) Difficulty in implementation
  - (c) Supervisory problems
  - (d) Lack of support from workers
  - (e) Lack of support from unions
  - (f) Production problems
  - (g) Any other (please specify)

The first questionnaire item, which reflects the attitude of a person regarding training, can be evaluated by adding the weighted value of individual responses.

Example:

Let the number of respondents be fifteen. Suppose they have given their responses as follows to the four alternatives.

Alternatives	No. of Respondents
(a) To a large extent	4
(b) To some extent	4
(c) To a very little extent	5
(d) Not at all	2
Total	15

**Weighted average attitude:**

Alternatives	No.	Weighted	Attitude
(a)	4	4	16
(b)	4	3	12
(c)	5	2	10
(d)	2	1	2

Alternative (a) 'To a large extent' is the group attitude.

The second questionnaire item allows the respondents to answer the question by selecting all alternatives in order of their perceived priority. This requires the use of factorial method for quantification of all responses. Let us give an example to illustrate the matter.

Example:

Let there be fifteen respondents. Suppose they have responded by giving ranks to the alternative (a) as follows:

Respondent	1	2	3	4	5	6	7	
Rank of (a)	1	3	5	7	1	4	3	
Respondent	8	9	10	11	12	13	14	15
Rank of (a)	2	6	5	1	2	3	4	5

From the above, we get:

Priority/Rank	1	2	3	4	5	6	7
Number of Respondents (Tr)	3	2	3	2	3	1	1

(Total No. of respondents = 15. No. of Priorities/Ranks = 7, i.e., a to g)

Weighted Score Value (WSV) is calculated as follows :

Priority	1	2	3	4	5	6	7
Total Value	3	2	3	2	3	1	1
Weights (factorial)	7	6	5	4	3	2	1
WSV	21	12	15	8	9	2	1

In the same way, the total weighted score value for other alternatives can be calculated from the responses obtained against each component. Suppose they are as follows:

Alternative	b	c	d	e	f	g
Total WSV	65	30	70	55	60	40

The total weighted score value of alternative (d) is the highest. Therefore, alternative (d) i.e., 'lack of support from workers' should be the attitude/opinion of the group of respondents.

For the measurement of attitude, we can use various statistical tools. Since attitudes are psychological variables or qualitative variables, the first and the foremost task for the rater is to assign numerals to objects, events or persons. Use of Likert type of scale, Thurstone scale, etc., help the interviewer to assign

numbers, either discrete or continuous. Analysis of Variance, Correlation, Chi-Square Test, Kendal's Coefficient and Concordance Test are some useful statistical tools for attitude measurement.

**Attitude Scales:** Attitude scales measure one or more aspects of an individual's or group's attitude toward some object. Individual's responses to the various scales may be aggregated or summed to provide a single attitude for the individual. Similarly, group responses to the various scales may be aggregated or summed to provide a single attitude for the group.

These scales are of three types:

- Likert's Summated Scales
- Thurstone's Equal Appearing Intervals Scale
- Guttman's Cumulative Scale

**Likert's Summated Rating Scale** is set of attitude statements of which all are considered or approximated as equal attitude value and to each of which subjects respond with degree of agreement or disagreement (intensity) carrying different scores. These scores are summed and averaged to yield an individual's attitude score. Under this method, each respondent's ranking is found out by totaling his scores on all the statements (usually 5). To illustrate this, let us have the following example:

S.No.	Statement	Agree	Disagree
1.	Advertising promotes sales	1	0
2.	HRD is exploitation of people	1	0
3.	Hard work increases productivity	1	0
4.	Effective time management reduces idle hours	1	0
5.	Money and other physical benefits are the only motivations	1	0

This procedure, however, suffers from following drawbacks:

- Ties in ranks occur quite frequently. There may be several respondents with total scores of 0,1,2,3,4,5, who cannot be ordered in relation to one another.
- It does not throw light on the different way in which given scores may be obtained. Different combinations of the score imply differences among individuals who are not revealed by this procedure.
- It is not possible to determine whether the scale is unidimensional or multidimensional, i.e., whether the statements are measuring only one property or several properties of an attitude.
- In this scale, all statements are deemed to be of equal attitude value. This method orders the individuals on the basis of their total scores and not statements.

### Likert's Item Analysis

In this procedure, respondents are asked to respond to a certain number of statements (which is usually restricted to fifteen). Reply to each statement is given in terms of five degrees of agreement or disagreement, viz., 'Strongly agree', 'Agree', 'Undecided', 'Disagree', 'Strongly Disagree'. Each statement, thus, becomes a scale in itself having five points on it. At one end of this scale is the strong approval and the other end is the strong disapproval; between them there are many intermediate points. The respondent indicates with reference to each statement where he stands on this scale. The total of his scores on all statements is taken as the measurement of his attitude. Statement may be either favourable or unfavourable. For favourable statements, values given are 5,4,3,2,1 and for unfavourable statements values are 1,2,3,4,5.

The following example will illustrate this:

Statement	SA	A	U	D	SD
Management is a science	5	4	3	2	1
Management is not a science	1	2	3	4	5

**Thurstone's Equal Appearing Intervals Scale** attempts to represent the attitudes of a group on a specified issue in the form of frequency distribution. The various opinions or items on a scale are allocated to different positions in accordance with the attitudes they express. Following steps are necessary to construct a Thurstone attitude scale.

1. Brief statements expressing attitudes about a particular issue are gathered from current literatures or are especially prepared for this purpose. The statements should cover different range of attitudes from extremely favourable to extremely unfavourable and also include neutral statements.
2. Statements are given an arbitrary number for identification and a group of judges are asked to sort those into several piles.
3. After sorting, a complete tabulation is made to determine the number of times each statement is included in the several piles.
4. The scale values for each statement are determined graphically in the form of an ogive or cumulative frequency curve.
5. The final scale is then made, selecting fifteen to twenty statements (preferably those on which judges have had least disagreement).
6. Respondents then are asked to check only those statements with which they agree.

The construction of this scale being very cumbersome and time consuming, it is usually avoided. Moreover, scale values assigned to statements are influenced by the attitudes, background and intelligence of judges who may see things different from the actual respondents. This scale also does not allow subjects to express the intensity of the feelings of the respondents as they have only the choice to indicate their agreement with the finally selected statements.

**Guttman's Cumulative Scale** is made up of a relatively small number of statements which have been tested for their unidimensionality. A unidimensional scale measures one variable only. The scale is known as cumulative as respondents agreeing with the most favourable statements are theoretically presumed to agree with all other statements expressing 'lesser' degree of favourability. Use of this scale is also avoided for its complexity.

Other scale to measure the attitude is *Social Distance Technique of Bogardus*, which is normally used to measure highly subjective attitudes.

### HRD and Attitudinal Change

Changing attitudes, values and motivations are now the major issues before the organizations. Through appropriate HRD interventions, organizations can turn such change into advantages, ensuring quality of work life and keeping pace with the changing human expectations. The following areas of attitudinal changes require HRD intervention.

- (a) Attitudes towards perceived threats to trade union legality and other large scale efforts to reduce trade union power or cohesion
- (b) Attitudes towards methods of wage negotiations, whether by collective or local bargaining
- (c) Attitudes towards working conditions and any administrative machinery for the discussion or regulation of such conditions
- (d) Attitudes towards workers' training or promotion and towards education, in general, as means of improving management and industrial skills

As explained earlier, economic restructuring, market globalization, international quality system standards, etc., have, inter alia, prompted the Indian organizations to go for radical organizational restructuring, which among others calls for the adoption of TQM principles in managing the human resources. TQM, inter alia, calls for total employee involvement (TEI), employee empowerment, development of small group activities (quality circle forums), value engineering teams, etc. To translate the TQM requirements into corporate practices, therefore, requires a lot of attitudinal changes at the top like, developing flatter type of organization, delayering delegation and information, organizational culture, where every employee needs to be considered as a member of a well-integrated family. To infuse these attitudinal changes both at the top and at down the level, it is necessary to adopt following HRD strategy.

- (a) **Employee Empowerment:** Empowerment is to give everyone—instead just people with certain positions or certain job titles—the legitimate right to make judgement, form conclusions, reach decisions and then act. Empowerment, therefore, calls for employee participation in day-to-day problem solving and innovation. Traditional participative forums (Works Committee, Joint Consultative Machinery, etc.) restrict employee participation in operational areas. However, empowerment demands employee participation in each and every corporate functions, so much so as to accept that the employee is not a mere seller of his time and labour for a contracted sum of money. The empowered employee acquires necessary skill and authority to make decision concerning quality and productivity. They initiate changes on their own. Empowerment changes attitude of the employee as it develops employee ownership and commitment.

- (b) **By Promoting Quality Circles and Developing the Culture of Total Participation:** This strategy is used to infuse attitudinal changes and to facilitate personal involvement of employees.

Quality circles (QC) have been defined originally by JUSE (Japanese Union of Scientists and Engineers) as a small group of workers, voluntarily performing quality control activities within the workshop to which they belong. These small groups, with voluntary participation of each and every member of the organization continuously engage themselves in promoting quality control activities. They have the total participation of the members of the organization, irrespective of their hierarchical levels. Quality circles, in reality, encompass the concepts of self-development and mutual development and, at the same time, reinforce quality control techniques. Even though the concept of quality circles originated in Japan to survive under compelling circumstances, it has now been expanded far and wide, cutting across cultural and ideological barriers. It has gained popularity gradually in most of the industrialized nations and among the developing nations of the world. India, being one of the fast developing nations, is no exception. QC can be related to the increased employee motivation and productivity, and hence it is used as an important HRD tool in an organization. Total knowledge, skill, creative abilities, talents and aptitudes together with values, attitudes and beliefs of the workers and/or individuals of the organization represent the human resources in more aggressive terms. QCs ensure total involvement of employees through a number of small group forums. Experience shows that many organizations have succeeded to improve their productivity by QC activities. Increased productivity can be achieved by the increased employee motivation, which QCs can better ensure than any other methods like complex planning, rigorous execution, etc.

- (c) **By Imparting Knowledge and Value-laden Attitudinal Changes in Training:** Organizations need to focus more on training on human relations areas like, leadership, communication, motivation, etc. Such knowledge inputs gradually reinforce the attitude of the employees.
- (d) **By Focusing More on Team Spirit:** To integrate employees with the organization, the focus should be team spirit. This initiative is further strengthened when we simultaneously ensure a sense of belongingness among the employees.

### Interview

In the literal sense of the word, an interview means a conversation with a purpose. Such purposes are classified under three categories, i.e., obtaining information from the candidates, giving information to the candidates and finally to motivate the candidates. The first purpose is intended to get information from candidates regarding their background, experience, education, training and interests to evaluate their suitability as per the requirements of the organization. The second purpose is to provide the candidates information regarding the organization, its philosophy, personnel policies, etc. The third purpose is to establish a positive relationship to motivate the prospective candidates to join the organization. However, all these purposes being successive stages of interview, the subsequent

stages will be followed only when the interviewers are *prima facie* satisfied with the candidates in the first stage.

HR Department of most of the organizations conducts preliminary interview for the candidates. However, for a subsequent interview, a committee of executives is formed to select the right candidate(s). For managerial and executive positions, organizations prefer to retain the service of consultancy organizations with subject experts in the selection committee.

### Types of Interviews

- (a) **Patterned Interview:** This is also known as structured or standardized interview. It is intended to assess the candidate's emotional strength and stability, industry, ability to get along well with others, self-reliance, willingness to accept responsibility, motivation, etc.
- (b) **Indirect or Non-Directive Interview:** This type of interview is meant for helping the candidates to feel relaxed and free to talk. Interviewers become listeners and allow the candidates to reveal their personality, in-depth knowledge in a free and relaxed atmosphere.
- (c) **Direct Planned Interview:** It is a simple question-answer session to ascertain the suitability of the candidates.
- (d) **Stress Interview:** This interview assesses the candidates' emotional balance under a situation of tension and stress. Such tension is, therefore, deliberately created by interruptions, provocations, silence, criticisms or even by firing questions. Interviewers in such a situation deliberately become more unfriendly and even, at times, hostile. Such method is often adopted for the selection of executives, who are required to work under stress.
- (e) **Group Interview:** This method is intended to assess the leadership ability of the candidates. Generally, a topic is given to the candidates to discuss among themselves. The interviewers remain in the background to assess the best leaders, their initiative, poise, adaptability, awareness, interpersonal skills, etc.
- (f) **Panel or Board Interview:** Several interviewers collectively interview a candidate to rate his/her attributes. Generally, such a panel consists of several experts and each of them interviews a candidate only in those areas on which they have the requisite expertise.

For conducting a successful interview, interviewers should be adequately competent and trained. Interview should be conducted in a suitable place. It should be well planned; job descriptions and information about the applicants should be adequately studied. Interviewers should be free from any conceivable prejudice. Interviewees should be allowed to feel relaxed and the beginning and end of an interview should be made in a best possible friendly manner.

The limitations of a traditional selection process like failure to select the right persons for the right jobs or too much emphasis on written tests and interview resulted into the development of psychometric method. This method enables us to quantify the attributes, adding which we can select the candidates in order of their merit. Many organizations today are making use of this method to ensure proper selection of their employees.

## Induction

After the selection of employees, the first step is to orient them to the organizational life. Induction or orientation programme of an organization is a process to guide and counsel the employees to familiarize them with the job and the organization. This process helps an organization to clarify the terms and conditions of employment, specific job requirements and also to inculcate confidence in the minds of the new entrants.

### Objectives of Induction Programmes

General objectives of such a programme normally are:

1. To introduce new employees with the organizational environment, exposing them to the mission, history and traditions of the organization, its achievements and future challenges, its personnel policy and expectations from the new employees
2. To create a positive attitude in the minds of the new employees
3. To create proper awareness in the new employees enabling them to understand the business of the organization
4. To provide opportunity to interact with other fellow employees and also with other managerial employees of the organization

### Components of Induction Programme

A good induction programme should contain following areas which are conveniently distributed under organization's point of view and employee's point of view.

#### Organization's Point of View

1. History, mission, objectives and philosophy of the organization
2. Its product, production process, operations involved, state of technology
3. Its past achievements, present status and future growth plan
4. Structure of the organization and the functions of different departments
5. Delegation of authority and decision-making process
6. Personnel policies, other miscellaneous policies, practices and regulations
7. Job descriptions and responsibilities
8. Expectations from new employees

#### Employee's Point of View

1. Job responsibilities
2. Office procedures
3. Grievance handling procedures
4. Salary and perks
5. Service rules governing hours of work and overtime
6. Rules covering probation, confirmation, promotion opportunities, transfer etc.
7. Retirement and superannuation benefits

8. Employee services and welfare activities
9. Employee's participation in small group activities, question schemes
10. Performance evaluation

### Steps in Induction Programme

An induction programme essentially involves following steps:

#### General Orientation

It includes guided tours in different departments of an organization, introduction with fellow employees, supervisors and executives, information about the organizations' mission, philosophy, achievements and future plans, etc. Some organizations have their printed manuals, which they give to their new employees to orient them with their induction training programmes for a week or so. The purpose of such general orientation programme is to build a sense of pride in the minds of the new employees and also to create an interest in them about the organization.

#### Specific Orientation

This is intended to help new employees to get acclimatized with their new work environment. The supervisor or the departmental boss of the employee takes him on a round to his place of work and impart vocational guidance for his particular nature of work. He is also told about the technology, environment and other facilities available in the organization and also about the prevailing practices and customs and specific expectations from an employee. For executives and managerial employees, targets and Key Result Areas (KRAs) for each of them are given to make them aware of what organization expects from them.

#### Follow-up Orientation

This orientation is conducted after some time of initial induction of an employee, i.e., preferably within a period of six months or so. The purpose of such orientation is to give guidance and counsel to the employees to ensure that they are reasonably satisfied and gradually settling down.

### Employee Socialization Process

Employee orientation and induction is also called employee socialization process. In today's world, socialization is a continuous process due to the fact that the organizations have become dynamic. For the new employees, Decenzo and Robbins (1999) identified that the socialization process involves three distinct stages as follows:

#### Pre-Arrival Stage

At this stage, an individual employee comes to an organization with certain values, attitudes and expectations. At the selection stage only, an prospective employee needs to be enabled to understand to what extent his perceived mapping gets along with the organizational culture and systems. It is the duty of the persons involved in the selection process to facilitate this. Nowadays because of the availability of

information about organizations through different media, including Websites and Internet, an enthusiastic individual may also have some preconceived ideas about the organization. Therefore, it is better to first understand from the individual what he understands about the organization and then help him to synchronize this information with the reality. This helps the individual to take the right decision.

### Encounter Stage

At this stage, perceptions earlier generated by an individual, are reaffirmed through a well-planned induction programme. Any dichotomy between the employee's perceptions and organizational perceptions, needs to be properly identified and removed through increased socialization process.

### Metamorphosis Stage

At this final stage of socialization, employees understand the organization and identify themselves with it. Employees develop a sense of belongingness and become contributors to achieving organizational goals and objectives.

However, as explained earlier, socialization is a continuous process, as organizations are now required to go for restructuring and reengineering every now and then, keeping pace with the changing environment.

### Placement

After the initiation programme is over, an employee is put to a specific job, for which he has been selected. Most of the organizations put new employees on probation for a specified period after which they are confirmed or made permanent, provided they match the requirements of the organization. Personnel department periodically reviews the progress of such employees getting feedbacks on their performance from their controlling authority. Some organizations also have a system to extend probationary period, if the employees fail to match to the organizational expectations. Such second placement is known as 'differential placement'.

Placement is defined as assigning employees job profile for which they have been identified as suitable based on the selection techniques. However, such definition would be meaningless, if a particular employee is recruited against a particular vacancy. Generally, the question of placement arises when a group of trainees are recruited. Organizations, to identify the true potentiality of an employee, in such cases, make provision for short-term placements, during which phase, employees are allowed to work on different jobs through a systematic job rotation programme. However, at the later stage, the permanent placement is effected matching up with the employees' competence, knowledge, skills and interests. Other forms of placements have been discussed in the chapter on Transfer and Promotion.

### Importance of Induction and Placement

Common use of higher technology, increased level of knowledge and skills of the new job entrants, production restructuring and flexibility coupled with perceptible change about human resource, which is now considered as the most important resource of an organization, have now transformed labour as an item for competition in sale and purchase. However, despite the problem of unemployment in India, there still exists a dearth of knowledge and skilled workers and so also executives and

managers. Recent economic liberalization programme of the Government of India has paved the way for the entry of multinationals and foreign companies. Market globalization has further intensified the competition. Development of total quality management philosophy, *Inter alia*, is also demanding sea-change in product mix and service mix of an organization. All these together have now increased the scope for job mobility for employees with knowledge and skills of appropriate type and degree.

Unfortunately, retaining employees after the recruitment and selection is an utterly neglected area in Indian corporate sector. Many organizations spend several lakhs of rupees in terms of job advertisement, conducting tests and interviews, hiring the services of consultants and psychologists, etc., for selecting a managerial employee. However, a weak induction programme, without adequate emphasis on building confidence and sense of belongingness in the minds of the new employees, results in quick separation and subsequently the wastage of a colossal sum of money for the organization. Such experience is quite common in public sector units. Very recently a leading Tata organization has lost a few hundreds of their young engineers and professionals, who left in mass to join elsewhere.

Some organizations, on the contrary, do not review the progress of the new employees, who get permanent automatically after completion of their probationary tenure, despite the reason that they are unproductive.

Thus, a good induction and placement programme is needed to ensure employees' retention by keeping their motivation high, whereas, at the same time, getting rid of the unproductive employees within the organizations.

### SUMMARY

Recruitment, selection, induction and placement are important tools for hiring manpower from external sources. Organizations, through human resource planning, identify the manpower requirements, keeping pace with corporate objectives and strategies.

After the assessment of manpower requirement, it is important to identify to what extent such requirements can be met from internal sources by restructuring and redeployment. After this exercise is over, additional manpower requirements, if any, have to be met through external hiring. While doing external hiring an organization needs to follow certain steps like, recruitment, selection, induction and placement. At all these stages, certain norms are required to be followed to ensure proper selection and placement.

### Key Words

**Internal Recruitment:** This is the process of hiring from within the organizations. In some cases, organizations try to internally man higher managerial vacancies from their existing employees. In those cases, organizations need to develop their existing manpower by adopting suitable training and development functions. Training and development may not necessarily always ensure the availability of the best talents internally. Organizations are then compelled to recruit from outside sources, mentioned above.

**Patterned Interview:** This is also known as structured or standardized interview. It is intended to assess the candidate's emotional strength and stability, industry, ability to get along well with others, self-reliance, willingness to accept responsibility, motivation, etc.

**Non-directive Interview:** This type of interview is meant for helping the candidates to feel relaxed and free to talk. Interviewers become listeners and allow the candidates to reveal their personality, in-depth knowledge in a free and relaxed atmosphere.

**Stress Interview:** This interview assesses the candidates' emotional balance under a situation of tension and stress. Such tension is, therefore, deliberately created by interruptions, provocations, silence and criticisms or even by firing questions. Interviewers in such a situation deliberately become more unfriendly and even, at times, hostile. Such method is often adopted for the selection of executives, who are required to work under stress.

**Follow-up Orientation:** This orientation is conducted after some time of initial induction of an employee, i.e., preferably within a period of six months or so. The purpose of such orientation is to give guidance and counsel to the employees to ensure that they are reasonably satisfied and are gradually settling down.

**Metamorphosis Stage:** This is the final stage of socialization. At this stage, employees understand the organization and identify themselves with it. Employees develop a sense of belongingness and become contributors to achieving organizational goals and objectives.

## REVIEW QUESTIONS

1. Define recruitment. What are the important recruitment functions? Why are such functions important for an organization?
2. What is internal recruitment? Why is it important for an organization? Do you think it is necessary to have a recruitment policy for an organization?
3. What are the different recruitment processes? Briefly state their merits and demerits.
4. Briefly discuss the importance of selection process and mention the steps involved in such process.
5. You have been retained by an organization to select a few management trainees. What process do you think you should consider and why?
6. What is the objective of an induction programme? What are the important areas that need to be considered for an effective induction programme?
7. What are the different steps involved in an induction programme? In what ways, in recent times, have induction and placement become important for Indian organizations?
8. Define attitude. Why is the study of attitude necessary for HRD profession?
9. What are the different tools for attitudinal measurement? From an organizational point of view, discuss in detail at least two measurement tools with due emphasis on their relative merits or demerits.
10. You have been retained by a company to study the attitude of their fifty employees on the recently introduced pension scheme. Develop at least five structured closed-ended questionnaire, using Likert's Item Analysis Scale and interview the employees. Analyse all the responses using Factorial Method and measure the attitude of employees.

## Short Notes:

- (a) Differential Placement
- (b) Job Rotation
- (c) Probationary Period
- (d) Follow-up Orientation
- (e) Stress Interview
- (f) Application Blank
- (g) Deputation
- (h) Successive Hurdles
- (i) Cumulative Scale
- (j) Summated Rating Scale
- (k) Equal Appearing Intervals Scale
- (l) Employee Empowerment and Attitudinal Change

## REFERENCES

1. Bhattacharyya, D.K. 2006, *Human Resource Management*, 2nd Edition, New Delhi: Excel Books.
2. Bhattacharyya, D.K. 2009, *Organizational Behaviour-Concepts and Applications*, New Delhi: Oxford University Press.
3. Daft, R.L. 1995, *Understanding Management*, Orlando: Harcourt Brace & Company.
4. Davenport, T.H. 1993, *Process Innovation: Reengineering Work through Information Technology*, Boston: Harvard Business School Press.
5. French, W.L. 1990, *Human Resource Management*, 4th edition, Boston: Houghton Mifflin.
6. Gary, Dessler 1998, *Human Resource Management*, 7th edition, New Delhi: Prentice Hall.
7. Handy, C. 1989, *The Age of Unreason*, London: Century Business.
8. Herzberg, F. 1966, *Work and the Nature of Man*, Cleveland: World Publishing Co.
9. Robertson, I., and M. Smith. 1985, *Motivation and Job Design: Theory, Research, and Practice*, St. Paul: West Publishing Co.
10. Rush, H. 1971, 'Job design for motivation: Experiments in job enlargement and job enrichment', New York: The Conference Board.

## APPENDIX 4.1

Name of the Post

Advertisement No.

Personal Data

Full Name:		Applicant's Photograph	
Ms/Mr			
Languages:	Speak	Read	Write
Mother Tongue			

(Continued)

Date of Birth, State, Marital Status			
Nationality, Whether SC/ST			
Height:.....cm	Weight:.....kgs	Vision : Normal/Corrected Spectacle Lens Nos.	
Address to which we should write: Telephone No.		Permanent Address Telephone No.	
Father's/Husband's Name and Occupation:			
If you have any relative employed in/or on the Board of our company, please give details.			
Details of previous employment in this company or its sister concerns, with reasons for leaving.			
Details of previous employment elsewhere, with reasons for leaving			
Languages:	Speak	Read	Write
Mother Tongue			

**Education**

Examinations	School/ College	Year From	Attend To	Major Subjects	Class, Percentage of Marks and Ranks
Scholastic Achievements					
TRAINING					
Name of the Firm/ Institution	From	To	Details of Training	Stipend, if any	
WORK EXPERIENCE					
Employer	From	To	Position held and nature of work	Salary p.m. Basic Total	

**Extra Curricular Activities**

Types of activities	At School	At College	Elsewhere
Official Position held:			
Sports			
Participation			
Positions held			

(Continued)

Captain, Secretary/ Manager			
Have you ever been convicted? If so, give full details			
Have you had any major illness, operations or accidents?			
Any other information that you would like to furnish:			
Name and addresses of three persons other than relatives to whom we may write for reference:			
Name	Address		
Minimum Salary Expected:			
We appreciate your time and effort you have spent in completing this application. Please check your application to ensure that you have completely and accurately answered each and every question.			
I declare that the particulars given above, are to the best of my knowledge, correct and complete and undertake to inform the company immediately of changes, if any, in respect of my particulars given above. I confirm that there is no legal bar in my applying or for accepting the above mentioned employment.			
Date	Signature of the applicant		
I have verified the certificates and testimonials where necessary			
Date	Officer-in-Charge		

# Direction and Motivation in Organization

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand the meaning and characteristics of direction
- be familiar with the definition and concepts of motivation
- understand the process of motivating employees
- realize the importance of motivation and its relation to employees' morale and productivity
- know the different theories of motivation

## INTRODUCTION

While introducing the concept of management, we have already discussed about the directing function. Direction as a managerial function initiates organized action with the purpose of fulfilling organizational objectives. A manager accomplishes organizational goals and objectives by directing. Direction involves issuance of directives and the guidance to subordinates; hence, it is an interpersonal aspect of the management. Through effective direction, an organization tries to create an appropriate work culture to reap the dormant potentiality and creative talents and abilities of people. Since, it requires understanding of human nature and behaviour, direction inculcates beliefs, hopes, ambitions and interaction pattern.

## MEANING AND CHARACTERISTICS OF DIRECTION

To understand the meaning and characteristics of direction, let us first review some of the definitions of direction given by some renowned authors.

Urwick and Brech defined direction as 'the guidance, the inspiration, the leadership, etc.' Theo Haimann considers it as 'the process and techniques utilizing in issuing instructions and making certain that operations are carried out as originally planned.' Direction has also been considered by Koontz and

O'Donnell as the interpersonal aspect of managing by which subordinates are led to understand and contribute effectively and efficiently to the attachment of enterprise objective. All these definitions, therefore, categorize the elements of direction as:

- Issuing Instructions
- Supervision
- Motivation
- Leadership
- Communication

Motivation, leadership and communication have been discussed as separate chapters in this book. Issue of instructions and supervision, is the core managerial role. This has already been covered in our preliminary chapters; thus, it is repeated here. Issue of instructions is related to the communication function of the organization. Supervision is inbuilt with the leadership and control functions of the organization.

Some of the characteristics of direction are:

- Direction follows the principle of scalar chain, i.e., managers at the top level direct middle-level managers, who in turn direct operation-level people, who implement the plans
- Direction does not end just by giving instructions; it also calls for monitoring of performance of subordinates, i.e., supervision
- Direction encompasses all hierarchical levels in the organization. Every manager at his/her level of function needs to give direction to people, to accomplish organizational goals and objectives
- Direction is a continuous function, i.e., once managers give direction, the process does not end. At every stage, managers need to guide, teach, motivate and lead his subordinates
- Direction essentially deals with the human factor

With this introductory discussion on direction, subsequent three chapters discuss on motivation, leadership and communication, the three core functions of direction.

## MOTIVATION IN ORGANIZATION

To motivate means to incite. It is to create a desire to do a thing or to create a willingness to work in the manner in which we want a work to be done. It is distinct from the capacity to work. Yet in another way, it can be defined as a force that gives rise to behaviour—or influence the behaviour to do a thing. It is feeling or urge to do or not to do a thing to fulfil certain needs. Various management gurus like, Taylor, Mayo, Follet, Fayol, Maslow, McGregor, Herzberg, Chris Argyris, McClelland and many others have contributed to the theories of motivation. Here, however, our principal concern is to consider only behavioural aspects of motivation.

## Motivation Elements

Motivational perceptions of all type of employees throughout the world are fast changing in response to a number of key variables. The conventional motivational reinforcers, either extrinsic or intrinsic are gradually losing importance. What

exactly can motivate an individual again varies with time and space. In India also, it is not at all possible to identify and indicate one single motivational tool commonly applicable to various cross-section of employees. However, we can try to appreciate the relative importance of one or the other tool for a particular segment of employees belonging to some homogenous organizations.

Here we have discussed motivational elements in detail, supported by various leading theoretical and empirical works.

### Theories of Motivation

By now it has been established that motivational factors are perceived needs of the employees, satisfaction of which contribute to employees' performance and productivity. However motivation, per se, can be better defined as a process of governing choices. This process may be internal or external to the individual, that arouses enthusiasm and persistence to pursue a certain course of action. Motivation process starts with a physiological or psychological deficiency or a need that activates a behaviour or a drive that is aimed at a goal or incentive. All the definitions, therefore, authenticate that motivation is a behavioural syndrome, which develops when there is a perceived incongruence in employees' needs and expectations. With the widening of such perceived gap, employees feel demotivated and reduce their level of performance and productivity. On the contrary, if the gap gets reduced, employees feel motivated and contribute their best for achieving organizational objectives. From the organizational point of view, motivation process follows certain defined steps, which as a continuum, need to be periodically reviewed and strategized to ensure the proper renewal of the process. This helps to maintain the motivation of employees, which are evident from their behavioural congruence, matching organizational objectives.

In the first stage, it is important to identify the need deficiency of employees, if any. Need deficiency centres around extrinsic and intrinsic needs. Extrinsic needs are those which are related to material and tangible gains. Increased pay, incentives, bonus, better medical facilities, better retirement benefits, better canteen facilities are some examples of extrinsic needs. Intrinsic needs, on the other hand, are those which are related to the mental satisfaction and are abstract in nature. Increased status, challenge, sense of belongings, scope for growth and creativity, recognition, sense of achievement, etc., are examples of such needs. Identification of need deficiency is possible through direct observation of employees' behaviour and through a survey using structured questionnaire response. However employees, by and large, feel sensitized about giving responses to a survey questionnaire, obviously fearing they will get identified for giving any response that criticizes organizational policy. Confidentiality in survey responses can be ensured through a secret opinion poll, where questionnaire does not require any employees' identity. However, for better results, it is always desirable to integrate survey findings with personal interview, which can be in the form of an open discussion with employees by their respective seniors. Some organizations try to document such information from 360degree Performance Appraisal, incorporating certain items in the appraisal form itself. The existence of need deficiency can also be understood from the trend of employees' performance, developing a performance index or productivity index.

In the second phase of motivational process, organizations try to identify appropriate strategy to close the perceived need gap of their employees. There are many innovative ways to close such need gap without impairing the budget much. To take an example, the need for an increase in the pay structure can be ensured by reducing deferred benefits, i.e. Non-wage Labour Cost (NWLC) and including such reduced amount to the current pay structure of the employees. This is particularly important for those organizations who mostly employ young people in exploratory age group (less than thirty-five years). Similarly, making pay and performance linked also facilitates the development of a proper compensation structure to reward and motivate good performers. Similarly, the gap of intrinsic needs can be reduced, by adopting an enabling organizational structure, which among others foster creativity and growth.

Thus, in the third phase of motivational process, organizations enforce goal-directed behaviour. Goal-directed behaviour enhances performance and productivity of employees, which further influence compensation strategy and other motivational reinforcers.

Likewise, the cycle continues as an ongoing process in an organization, as at the end of the continuum, needs are again re-evaluated to understand the emerging need deficiency, if any. In Figure-5.1 below, we have illustrated the model as a continuum.

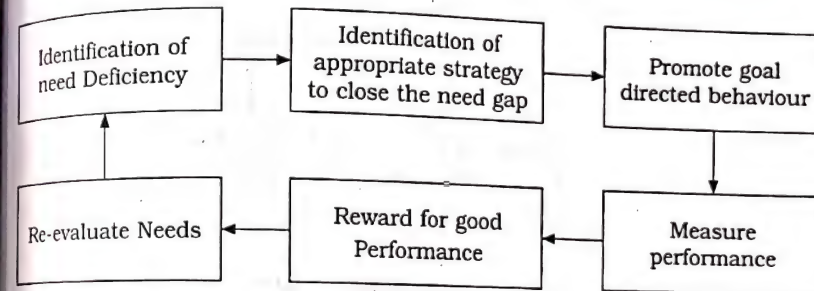


Figure 5.1: Motivation Model

### Important Objectives of Motivation

Motivation enhances performance and improves productivity. Therefore, motivation fulfils following important objectives of an organization:

- (i) Motivation ensures *productive use of resource*. Physical, financial and human resources are the important resource constituents for an organization. Proper utilization of such resources is only possible when people in the organization feel motivated. Motivation leads to goal-directed behaviour, which in turn facilitates productive utilization of all such resources. Important measures for the productive use of resources are Total Factor Productivity Indices and Labour Productivity Indices.
- (ii) The second important objective of motivation is increased *efficiency of people*. Efficiency of motivated people increases, as it augments their willingness to work. Increased efficiency also contributes to cost reduction.

- (iii) Thirdly, a motivated employee also becomes quality conscious, as behaviourally he identifies himself with the organization and always tries to take an extra care for his jobs. Motivation, therefore, also strengthens quality objectives of an organization.
- (iv) Fourthly, by promoting goal-directed behaviour, motivated employees also help to realize organizational objectives and strategies.
- (v) Motivation also promotes friendly work culture, increased morale, increased sense of responsibility, sense of belongings, integration of individual identity with organizational identity, team work, participative decision making etc. All these together create an environment for creativity and growth and truly transform an organization as enabling one.
- (vi) Finally, motivation ensures organizational stability by reducing employee turnover and absenteeism.

### Mechanism of Motivation

The word 'motivation' is used to describe the drive that impels an employee to work. Therefore, the process starts with physiological (extrinsic) or psychological (intrinsic) needs, satisfaction of which activates the drive to achieve a goal. Thus, the mechanism of motivation starts with a need, which activates a drive towards a goal. This we can explain using Figure 5.2.

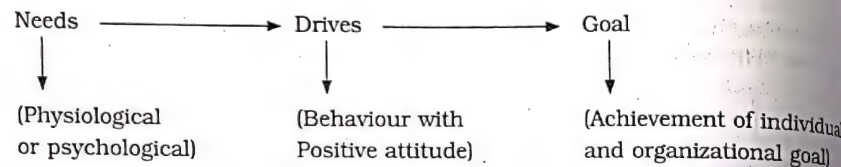


Figure 5.2: Mechanism of Motivation

At this stage, it is important to understand the basic differences between the terms *motive*, *motivation* and *motivating*. Motive is the inner state that activates and directs the behaviour of individuals towards certain goals. The inner state of an individual is created out of the perceived need imbalance. The degree of imbalance decides a strong motive or a weak motive and accordingly, an individual propels himself into action. Thus, motives create drives that energize people into action. While motive energizes action, motivation is the actual action or work behaviour. The degree of work behaviour decides the level of motivation. If an employee performs well, putting his best efforts, we consider his motivation as high, whereas, in the reverse case, we consider it as low. Motivating, as is used in motivating environment, implies inducements to energize work behaviour. This is a managerial role, as it satisfies both individual and organizational needs. Managers always try to sustain the motivating environment to get the work done in an effective and efficient manner. For this purpose, managers need to understand the degree of motive strength of employees. We have already explained the process of identification of need deficiency. Since, needs or motives are the reasons for a work behaviour, the managers, for effective decisions, need to plot the motives with the degree of importance, which can be done in the following manner.

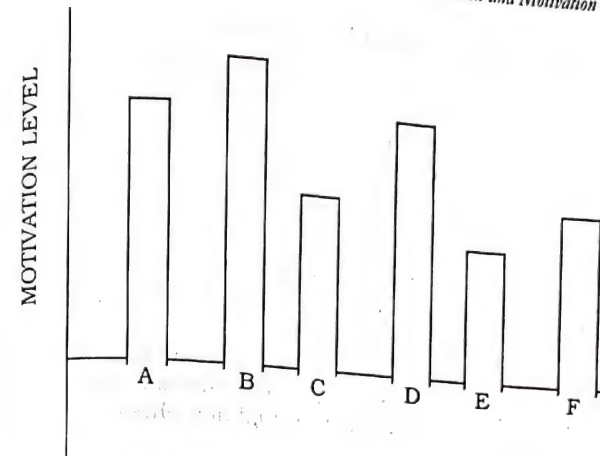


Figure 5.3: Different Motives

(A, B, C, D, E and F denote different motives, which may be compensation, promotional opportunities, functional autonomy, creativity, challenge and flexibility in policies)

Using the Pareto diagram, a manager can optimize the motive strength as the result of few causes and all causes are not equally important, 'a vital few: trivial many'. This means by taking care of 10-15 per cent of motive strengths, managers can reduce the need gaps in 70-80 per cent areas. This is because of interdependence and interrelationships in motive strengths. A typical Pareto diagram looks as follows:

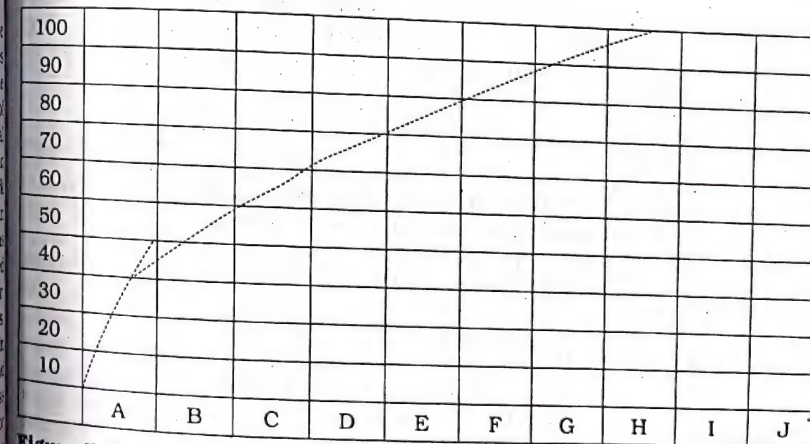


Figure 5.4: Pareto Graph

## Importance of Motivation in Organizations

As already explained, motivation is a part of directing function of organization. When managers act as good motivators, he/she can influence the members of the organization to feel motivated and deliver the desired results. Thus, motivation exerts the 'learned influences on human behaviour.' It is the degree to which an individual wants and chooses to engage in certain behaviours. Why is individual behaviour so important in trying to understand and influence motivation? The answer lies in following reasons:

- Every individual has a set of needs and a different set of goals
- Individuals behave in a way as to satisfy their needs and fulfil their goals. Therefore, individuals behave differently
- Businesses, as organizations, are in a position to offer some of the satisfactions that individuals seek, for example, relationships, sense of belonging, intellectual stimulation, mental and physical challenge, and self-development

For organizations, motivation is important because motivated employees contribute to:

- Higher productivity, (i.e., they produce more for a given level of resources than poorly-motivated workers)
- Better quality work with less wastage
- A greater sense of urgency (things happen quicker when they need to)
- More employee feedback and suggestions are made for improvements (motivated workers take more 'ownership' of their 'work')
- More feedback demanded from superiors and management
- Working at 80-95 per cent of their ability

## Theories of Motivation

We have already discussed theories of motivation in brief. Here, we will discuss major theories of motivation with some critical notes. Before we proceed further, let us examine the process of development of the theory of work motivation as given in Figure 5.5.

### Frederick W. Taylor (1856-1917)

Taylor, considered to be the father of scientific management, observed the prosperity of management and workforce are interdependent. People are inherently capable to do hard work, but they show such qualities irregularly. To harness such potentiality pay and rewards (incentives) must be linked to the achievement of 'optimum goals'. While good performers get rewards and better pay, bad performers loose on this count.

### Elton W. Mayo (1880-1949)

Mayo and his associates through a series of experiments, known as Hawthorne Experiments (Western Electric Co., USA, 1927-1932) established that work satisfaction and hence, the performance is basically not economic. It depends more on working conditions and attitudes, communications, positive management response and encouragement, working environment, etc.

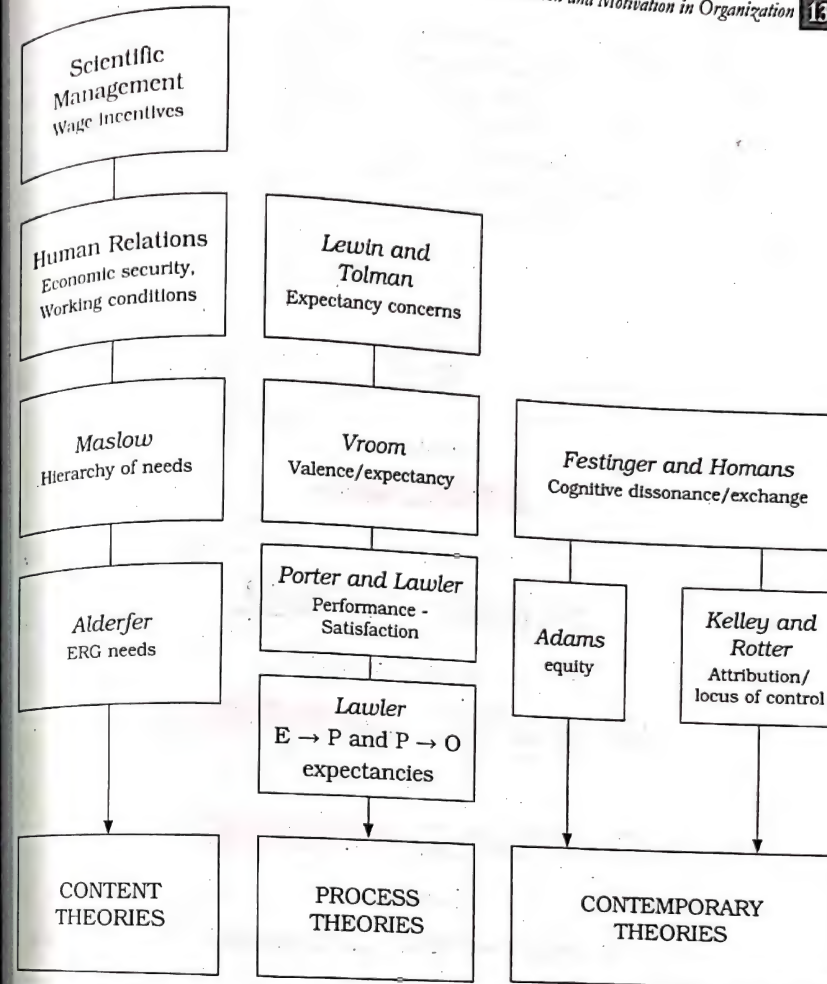


Figure 5.5: Work Motivation

Source: Luthans, Fred. 1998. *Organisational Behaviour*, 8th edition, Pp. 169. Boston: Irwin/McGraw-Hill.

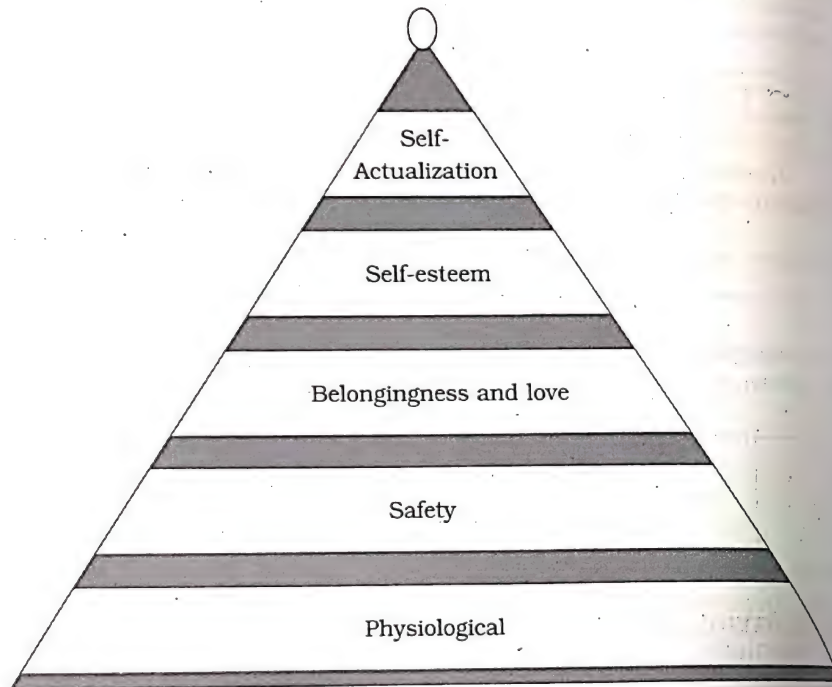
### Abraham Maslow (1908-1970)

Maslow, through his Need Hierarchy Theory established that motivation of people arises from levels, a hierarchy of needs. The essence of his theory can be summarized as follows:

1. Wants and desires of human beings influence their behaviour. Already satisfied wants and desires do not act as motivators. People show their motive or behaviour to fulfil their unsatisfied wants and desires.
2. Needs of the people are arranged in order of their perceived priority or hierarchy. Perceived need factors of people vary.

3. People can advance from one level of need hierarchy to another, only when their preceding need factors are satisfied. To take an example, without satisfaction of lower-order needs like, physiological and safety, people cannot advance to the satisfaction of belongings or social needs.
4. More the people advance to the higher-order needs, the more they display their satisfaction and motivation to work.

Maslow's *Need Hierarchy Theory* divides human needs into five distinct categories as follows:



**Figure 5.6: Maslow's Hierarchy of Needs**

Physiological needs are the basic needs of human beings which are essential to sustain or survive. Such needs include food, water, air, clothing, shelter, etc. From the organizational point of view such needs are met through salary and basic working conditions.

Safety needs ensure protection from economic and physical environment. People expect some reasonableness in their perceived environment, which minimizes the degree of uncertainty. Job security, degree of continuity, order, structure and predictability are precisely the nature of such needs. Organizations fulfil such needs of the employees by ensuring a protective work environment. Need for belongingness and love arises after satisfaction of earlier two lower order of needs. This kind of needs is also known as social needs. People in this need level develop

a strong sense of affiliation and get concerned with love, affection, belongingness, acceptance and friendship. Organizations meet such needs by providing appropriate work culture to help employees identify with the organization.

At self-esteem need level, employees look for satisfaction of their esteem or egoistic needs. Esteem needs pertain to self-respect and respect or esteem from others. Self-respect is ensured by achieving competence, confidence, personal strength, adequacy, success, independence and freedom. While respect from others come from prestige, recognition, acceptance and freedom. While respect from others appreciation, organizations, to fulfil such needs of employees, provide challenging work assignments, performance feedback, performance recognition, participative work culture, empowerment, participation in decision making, etc.

At the self-actualization need stage, employees desire to become what they are capable of becoming. They want to create something of their own using their talent, capacities and potentialities. Organizations try to fulfil such needs of employees by nurturing an environment that fosters creativity and growth.

### *Critical Evaluation of Need Hierarchy Theory*

Concepts of needs help the managers to understand the human behaviour at work. It also accounts for interpersonal variations in human work. Another important aspect is that it is dynamic as the model defines motivation as a constant changing force.

Despite above advantages, the theory is criticized for following reasons:

1. The theory has no empirical support. Moreover, it is not a theory of work motivation. Maslow even did not intend to relate his theory to work motivation. Maslow's theory was in fact popularized by Douglas McGregor and others, as work motivation theory.
2. It is not possible to put needs in strict defined levels. In fact, hierarchy of needs is simply a misnomer. An employee who is motivated by self-actualization need may still have lower-order needs like food and shelter.
3. The theory is not culturally aligned. It is more specific to western culture than anything else. However, work is perceived differently in different culture. Hence, motivations to work are different in different countries; sometimes it even varies within a country, from one individual work group to another. Therefore, the theory cannot hold good for heterogeneous work groups.
4. Maslow's existential philosophy is questioned as people may not like to remain content and plateaued with the satisfaction of their lower order needs. They may like to move further up in the hierarchy.
5. Diagnosing need deficiency for employees, following Maslow's approach is time consuming. Even after such diagnosis, it may not help an organization to develop a tailor-made model for employee motivation.

### *Herzberg's Two-Factor Theory or Motivation-Hygiene Theory*

Frederick Herzberg (1959), extending the work of Maslow, developed the Content Theory of Motivation. His study is based on responses of 200 accountants and

engineers, drawn from eleven industries in Pittsburgh area in the USA. Using critical incident method, he had asked the samples to respond on two aspects as follows:

- (i) When did they feel particularly good about their job
- (ii) When did they feel exceptionally bad about their job

Herzberg found that the samples described different types of conditions for good and bad feelings. Factors responsible for job satisfaction are quite different from the factors they perceive as contributors to job dissatisfaction. It means that employees are dissatisfied about their jobs not because of the absence of the factors that they consider to be satisfying in their jobs. Their reported good feelings were found to be associated with job experiences and job content. While, their reported bad feelings were found to be associated with the peripheral aspects of job. Since, his study was based on a two-factor hypothesis, we call his theory two-factor theory. As his study established that opposite of satisfaction is not dissatisfaction and removing dissatisfying elements from a job does not necessarily make the job satisfying, he has classified the factors into two categories:

- (i) Motivation factors
- (ii) Hygienic or Maintenance factors

Herzberg mentioned six motivation factors as given in the following:

- (i) Recognition
- (ii) Advancement
- (iii) Responsibility
- (iv) Achievement
- (v) Possibility of growth
- (vi) Job content or work itself

Presence of these factors in the job creates a motivating environment but the absence of these factors does not cause dissatisfaction.

Similarly, Herzberg mentioned ten hygiene or maintenance factors as follows:

- (i) Company policy and administration
- (ii) Technical supervision
- (iii) Interpersonal relations with subordinates
- (iv) Salary
- (v) Job security
- (vi) Personal life
- (vii) Working conditions
- (viii) Status
- (ix) Interpersonal relations with supervisors
- (x) Interpersonal relations with peers

These factors are context factors. Their existence just creates an environment for doing work. However, factors by itself cannot motivate people to work. In Herzberg's words, their absence can dissatisfy people but their presence, per se, cannot satisfy people.

The crux of the Two-factor Theory of motivation therefore, is that managers should be concerned about both the satisfying and dissatisfying factors. Mere improvement of hygienic factors cannot guarantee a motivating environment. In figure 5.7, we have presented the essence of Herzberg theory, using a diagram.

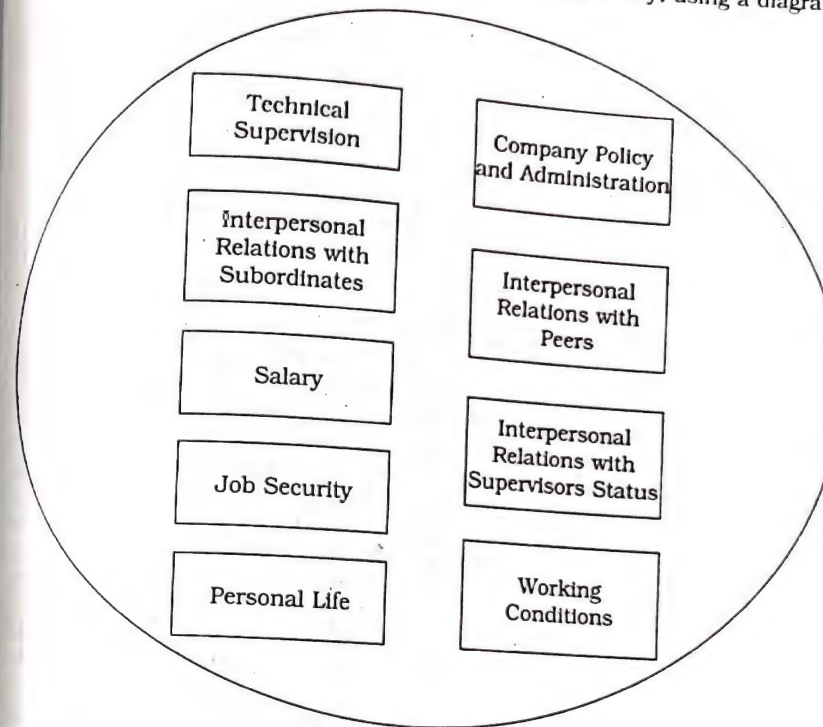


Figure 5.7: Hygiene Factors and Motivators

#### Critical Evaluation of Herzberg's Theory

Herzberg's theory is first of its kind based on field research unlike Maslow's work, which was based on clinical observations (laboratory-based findings). Herzberg did his study to understand motivation in work environment. Secondly, Herzberg's study recommends actions for managers to improve motivation in work environment. His emphasis on content factors, shifts the focus from traditional concept, where money was viewed as the most potent factor for work motivation. Thirdly, Herzberg had also contributed to the alternative approach to motivation by job enrichment. Finally, Herzberg had considered two dimensions of the employees' needs, instead of the absolute categorization into five distinct levels, as was done by Maslow.

Despite all the above listed merits, Herzberg's theory has also been subjected to following criticisms:

- (i) It is limited by its methodology. When things go well, people tend to take credit for the success. Contrarily, they attribute failures to the external environment.
- (ii) Herzberg's theory is also method bound. We cannot get the same results by using other methods. Critical incident method, by nature, may cause people only to recall the recent incidents or experiences. Moreover, while narrating a critical incident, respondents get wide flexibility to give vent to their opinions rather than the realities. Thus, according to many survey findings were more of opinions than actual happenings.
- (iii) Herzberg's model talks more about job satisfaction than job motivation.
- (iv) The theory ignores situational variables as it is not backed by adequate research in different work environments.
- (v) Even though the theory assumes a relationship between job satisfaction and productivity, the methodology applied by Herzberg limits its focus only on job satisfaction and not on productivity.

### Comparison of Maslow and Herzberg's Models

Herzberg's framework is compatible with Maslow's hierarchy of needs. Maslow referred to the needs or motives, whereas, Herzberg dealt with goals or incentives which tend to satisfy those needs. To illustrate, hygiene or maintenance factors of Herzberg are satisfied by physiological, safety and belongingness needs of Maslow, while motivation factors of Herzberg tend to be satisfied by self-esteem and self-actualization needs of Maslow. It is for this reason Herzberg's theory is often considered, as an extension of Maslow's Need Hierarchy Theory. Despite such similarities, there are some major differences between the two theories. Maslow's need hierarchy is a sequential arrangement of needs, whereas, Herzberg's model does not have any such hierarchical arrangement. Maslow believed that any unsatisfied need, irrespective of its level of hierarchy, can be a potential motivation. On the contrary, Herzberg believed that only the higher-order needs serve as motivators.

Richard Hackman and Greg Oldham (1975) developed a Job Characteristic Model on Herzberg's Two-Factor Theory, showing how a good job design can lead to internal motivation of the employees and contribute to better job performance. The theory postulates that five job characteristics lead to three psychological states, which affect the motivation and satisfaction of the employees. The five job characteristics are: skill variety, task identity, task significance, autonomy and feedback.

Skill variety is the extent or range of skills, abilities and talents of employees. The more they are able to utilize skills in the job, the greater their level of satisfaction. Hence, jobs are to be designed in a way that ensures the utilization of wide variety of skills of individuals. Task identity signifies the extent of involvement of employees in the job. This enables an individual to identify himself in the total creation, which gives him a sense of pride and satisfaction. Task significance, on the other hand, denotes significance of a job on the life of others—both within and outside the organization. A positive significance of a job gives psychological satisfaction to the person who does it. Autonomy is the extent of freedom given for a job. The degree of autonomy depends on the extent of independence given to an employee in deciding about job scheduling, formulating the procedures, decision

making without interference of others. The more the job autonomy, the greater the job satisfaction and so also motivation. Feedback provides the opportunity to assess the right or wrong for doing a job.

The three psychological states, which an individual experiences are as follows:

Skill variety, task identity and task significance provide experienced meaningfulness. Autonomy provides 'experienced responsibility', whereas, feedback ensures 'experienced knowledge of results'.

Once an employee experiences arousal of these three psychological states, they feel intrinsically rewarded, which results into intrinsic motivation.

Hackman and Oldham developed a *Motivating Potential Score* (MPS), based on their study, which measures the propensity of a job to become motivating. The formula is presented below:

$$MPS = \left[ \frac{\text{Skill variety} + \text{Task identity} + \text{Task significance}}{3} \right] \times (\text{Autonomy}) \times (\text{Feedback})$$

### ERG Theory

Clayton Alderfer (1972) of Yale University developed ERG Theory based on the empirical research. He modified Maslow's five levels of needs to three levels and labelled them as needs for *Existence*, *Relatedness* and *Growth*. The name ERG has been derived from the first letters of each such need. ERG theory differs from Maslow's Need Hierarchy Theory in following ways:

- (i) Instead of five need hierarchies, ERG Theory considers only three need hierarchies.
- (ii) Need Hierarchy Theory postulates rigid progression from one need level to another, whereas, ERG Theory assumes that more than one need may be operative simultaneously. This means an employee working on growth need, may even remain unsatisfied in relatedness and existence needs.
- (iii) Basic postulate of ERG theory is that it works on *Frustration-Regression Model*. If for any reason, employees continually become frustrated to satisfy their needs at one level, they intensify their desire to satisfy lower level needs. It is like a failure to get recognition is compensated by the desire to make more money. Contrarily, Maslow suggests people stay at a certain need level, till they are able to satisfy the same.

### Critical Evaluation of ERG Theory

ERG Theory is pragmatic in its approach, as it takes into consideration the individual differences among people. Individual differences in terms of education, family background and culture can alter the motive strength vis-à-vis the perceived need factors. The theory is more appealing, intuitive and logical than Maslow's Need Hierarchy Theory. Despite such advantages, the theory does not offer any clearcut guidelines. It just indicates that people get motivated to behave in a particular way to satisfy one of the three sets of needs, i.e., the need for existence, the need for relatedness and the need for growth. Moreover, the theory is yet to be backed by adequate research.

### McClelland's Three Needs Theory (nAch, nAff, nPow) or Achievement Motivation Theory

David C. McClelland (1976), through his twenty years of study at Harvard University, documented differences in needs of the people in three important areas as under:

- Achievement need (nAch):** People in this need category drive to excel, to achieve in relation to a set of standards. They like challenge and like to succeed in a competitive environment. They willingly work hard and volunteer for work which stretches their ability fully. This category of people does not get motivated by money. They feel more motivated with a sense of accomplishment and achievement.
- Affiliation Need (nAff):** This need emerges from the desire for friendly and close interpersonal relationships. Obviously, they try to fulfil such needs with satisfying relationships with the organization, peer groups, work teams, etc. Since this need group people try to identify them with the organization, they always prefer to foster a friendly work culture and try to meet their needs through friendly relations.
- Power Need (nPow):** People in this need group always try to get satisfaction by controlling others. This need emerges from the drive for superiority. Obviously, people in this need category look for leadership positions in the organization.

#### Evaluation of the Theory

McClelland highlighted the importance of matching individual and the job. People with high achievement need always prefer challenging job assignments, whereas, people with low achievement need, prefer a job situation that ensures stability, security and predictability. Organizations by manipulating the achievement need can get the complex jobs accomplished by high achievers. However, McClelland's work is criticized on many important counts like, how a sense of achievement or other associated motives can be inculcated in an adult employee. McClelland contends that this can be taught, and thus, motives related to achievement, etc., can be developed in an adult. This contention is not tenable in the psychological literature. Secondly, McClelland contends that needs can be changed through education and training; however, psychologists contend needs are permanently acquired.

Third, Thematic Appreciation Test (TAT) used for the study by McClelland is also subject to criticism as the interpretation of responses using TAT can be subjective, depending on the personal thoughts and opinions of the researcher.

#### Theory X and Theory Y

Douglas McGregor (1990) of MIT defined organizations as psychological entities. Therefore, organizations can be characterized by their assumptions about what motivates people. The basic hypothesis is that managerial decisions and actions are based on certain assumptions about human nature and human behaviour. McGregor proposed two distinct views and assumptions about human behaviour. A group of people was categorized by him under Theory 'X' and positive behaviour group people was categorized under Theory 'Y'. Employees labelled as Theory X

dislike work, are lazy, dislike responsibility and they need to be coerced to get the work done. Employees labelled Theory 'Y' like work, creativity, responsibility and they can exercise self-direction. Motivational implications of McGregor's analysis, therefore, can be best analysed in the context of Maslow's Need Hierarchy Theory. Theory X-labelled people can be motivated by the satisfaction of lower-order needs, whereas, Theory Y-labelled people can be motivated by the satisfaction of higher-order needs.

Attributes of different people falling under Theory X and Theory Y categories as observed by Maslow are presented in the chart below:

S. No.	Theory X attributes	S. No.	Theory Y attributes
1.	The average human being inherently dislikes work and will always try to avoid work.	1.	People of this group exercise self-direction and self-control in achieving objectives to which they have committed.
2.	People with such inherent characteristics must be coerced, controlled, directed and threatened with punishment to get work done from them.	2.	Commitment to objective is a function of reward associated with their achievement.
3.	The average human being prefers to be directed, avoids responsibility, less ambitious and, above all, likes security.	3.	The average human being learns (under proper conditions) not only to accept but to seek responsibility.
4.	For motivating this group of people, an organization has to enforce strict control and restrict the motivational reinforcements only to those areas that fulfil their lower-order needs.	4.	They have the capacity of imagination, intensity and creativity in the solution of organizational problems.
		5.	Organizations are able to only partially utilize their potentials.
		6.	People with these attributes need to be developed so that they can release their potential towards common objects. These people, by and large, can be motivated with the satisfaction of their higher-order needs.

### Cognitive or Process Theories of Motivation

Content theories of motivation lay emphasis on the importance of inner needs in motivation. On the contrary, cognitive models or process theories of motivation put emphasis on the idea that people take conscious decisions about their job behaviour. Therefore, to motivate, the process theory suggests that organizations must understand how an individual takes decisions and what efforts he puts for the job. Expectancy Theory, Equity Theory and Performance Satisfaction Model are the important approaches to understand the cognitive or process theories of motivation.

#### Expectancy Theory

This theory essentially emphasizes that people feel increasingly motivated if they perceive that:

- (i) their effort will result in successful performance
- (ii) successful performance will ensure desired results

Expectancy Theory has different names like, Instrumentality Theory, Path-Goal Theory and Valence-Instrumentality-Expectancy (VIE) Theory. It has its roots in the cognitive concepts of Kurt Lewin and Edward Tolman and in the choice behaviour and utility concepts from the Classical Economic Theory. However, it was Victor H. Vroom (1964), who formulated the Expectancy Theory, as an alternative to content models, for work motivation. The theory identified relationships among variables, which affect individual behaviour in a dynamic environment. It was an attempt to capture how people determine their extent of effort for a job and how such effort gets influenced by their perceived expectation. The strength of a tendency to act in a certain way depends on the strength of an expectation of outcome, which is likely to accrue upon the accomplishment of the job. So, motivation is the product of strength of one's desire (valence) and perceived probability of getting something good (expectancy). We can show such relationships as under:

$$\left[ \begin{array}{l} \text{Valence—} \\ \text{Strength of one's desire} \\ \text{for something} \end{array} \right] \times \left[ \begin{array}{l} \text{Expectancy—} \\ \text{Probability of getting it} \\ \text{with a certain action} \end{array} \right] = \left[ \begin{array}{l} \text{Motivation—} \\ \text{Strength of drive} \\ \text{towards an action} \end{array} \right]$$

V                      ×                      L                      =                      M

Valence is the degree of desirability of certain outcomes. It is, therefore, the strength of an individual's preference for a particular outcome, which may either be a promotion or a pay rise or recognition, etc., after he successfully accomplishes the job. Since people may have positive or negative preferences for an outcome, valence may be negative or positive. Hence valence may vary from -1 to +1.

Expectancy is the perceived possibility of a particular outcome that would follow after an action. It is, therefore, the strength of belief that an act will be followed by particular outcomes. The strength of expectations is based on the past experience. People expect what will happen in the future on the basis of what has occurred in the past. As expectancy is an action-outcome association

It may range from zero to one. If employees perceive no possibility of an outcome from certain acts, their expectancy would be zero, whereas, on the contrary, the value of expectancy would be one, when they feel (from their experience of action-outcome relationship) that they are likely to achieve something.

Vroom has used one more term in between expectancy and valence, which is usefulness or instrumentality. Instrumentality is the belief that the first-level outcome would lead to the second-level outcome.

To take an example, one may be motivated for a performance of the superior level, for his desire to get promoted. Here, the first-level outcome (superior-level performance) is seen as being instrumental for the second-level outcome (promotion).

Therefore, the strength of motivation to perform a certain act will depend on the sum of the products of the valences (including instrumentality) and the expectancies, which can be represented as follows:

$$\text{Motivation Strength} = \sum V \times I \times E$$

**Evaluation of the Theory:** It is believed that content theories oversimplified the complex process of work motivation, whereas on the contrary, Vroom's model highlights the importance of organizational behaviour, clarifying the relationship between the employees and the organizations. His model has generated research interests among the corporate and academic circles. The theory also has a cognitive dimension as individuals are viewed as thinking and rational beings, and they just do not simply act for the satisfaction of their unfulfilled needs.

Despite such unique features in Vroom's approach, his theory was also criticized for following aspects:

- (i) It needs to be adequately tested in different work environment.
- (ii) Employees may not always take a conscious decision. It was observed that they were also prone to take unthoughtful decisions, and later on, they tried to rationalize the action with their own logic.
- (iii) Linkages between efforts-performance and performance-rewards may not be linear. Organizational policies may further complicate the process. To take an example, promotion may be on seniority, educational background, etc.
- (iv) The theory is complex. In real life situation, managers may face time and resource constraints to implement it.

#### Equity Theory

This theory owes its origin to several contributors like Festinger, Heider, Homans, Jacques, Patchen, Weick, etc. However, James Stacy Adams' contribution is much discussed in the literature on motivation. The theory proposes that in a work environment, motivation is influenced by one's perception of how equitably he or she is treated compared to others. The theory is also known as 'Social Comparison Theory' or 'Inequity Theory'. Perceptively, employees try to reduce their inequity through such comparison or by establishing a hypothetical exchange relationship. An individual accounts for the amount of work he puts in and corresponding

rewards he gets for the same. He then compares the efforts and rewards of similarly placed person in the organization. If equity exists, the individual feels good or complacent about the situation. In case of inequity, it propels him into action to create a condition of equity. Since inequity propels action, it is the motivation. The greater the perceived inequity, the greater the motivation to reduce it. While doing so, individuals can make any of the following choices:

- (i) Change or alter inputs
- (ii) Change or alter outcomes
- (iii) Distort inputs and outcomes
- (iv) Distort inputs and outcomes of others (whom they compare)
- (v) Select a different referent (to compare)
- (vi) Withdraw from the field

**Evaluation of the Theory:** It is a promising theory of work motivation as well as job satisfaction. For this reason, it has generated extensive research. Since the basic theory works on the perception in a social comparison process, it is, by default, dynamic because inequity in perceived perception motivates employees to restore equity.

However, the theory is criticized for following reasons:

- (i) It is complex and difficult in application
- (ii) Perceptions are difficult to measure or assess
- (iii) Choosing a 'comparison other' may not be always correct
- (iv) A given factor may be an input as well as an outcome
- (v) The study is based on laboratory experiments rather than in real-life situations in organizations

### Performance Satisfaction Theory

Layman W. Porter and Edward W. Lawler (1968) based on Vroom's Expectancy Model, observed that performance leads to satisfaction contrary to our belief that satisfaction leads to performance. Other interesting observations made by them are that motivation (efforts), performance (accomplishment) and satisfaction are separate variables. This again is, in contrast, to our belief that motivation leads to performance, which in turn leads to satisfaction. Efforts (force or motivation) do not directly lead to a performance. It is mediated by abilities, traits and role perceptions. After performance, rewards that follow and the way they are perceived determine the satisfaction. The theory is illustrated in Figure 5.8.

Whether an individual will make an effort depends on the interaction between the value of reward (Box 1) and the perceived effort-reward probability (Box 2). Effort (Box 3) is the motivation. Performance (accomplishment) (Box 6) is not the direct consequence of effort. It is the product of effort (Box 3) abilities and traits (Box 4) and role perceptions (Box 5). Performance leads to certain outcomes in the form of intrinsic rewards (Box 7A) and extrinsic rewards (Box 7B). Both intrinsic and extrinsic rewards provide satisfaction (Box-9). However, such reward-satisfaction relationship is moderated by the perceived equity of rewards (Box 8).

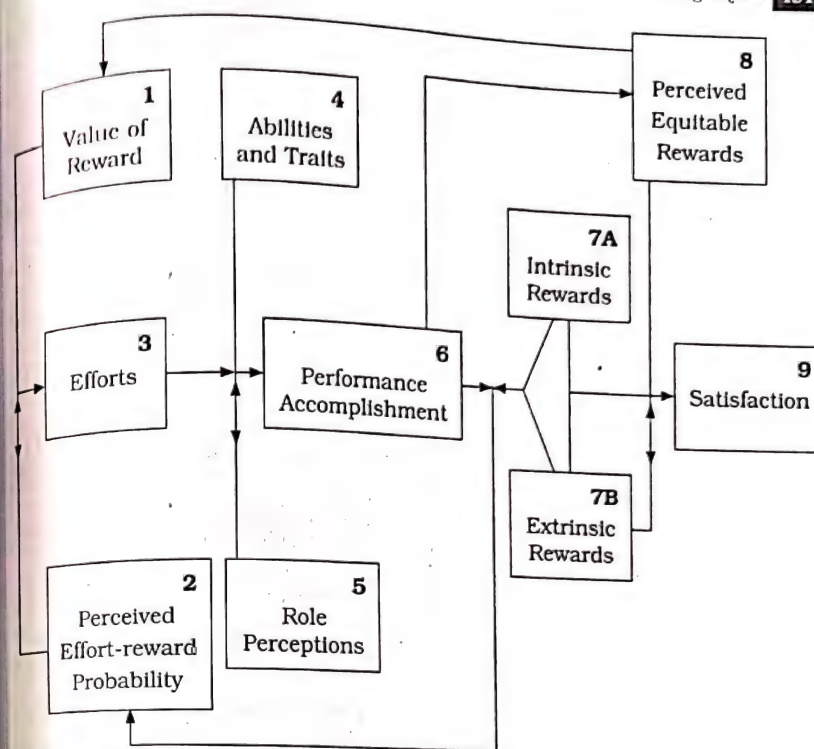


Figure 5.8: Performance Satisfaction Theory

### Attribution Theory and Locus of Control

Harold Kelley advocated Attribution Theory and Locus of Control, which are mainly concerned with the cognitive process by which an individual interprets behaviour attributing to certain parts of the relevant environment. Such casual relationships or attributes are interpreted by an individual for his own behaviour or for others' behaviour. Fritz Heider contended that both perceived internal forces (ability, efforts and fatigue) and external forces (others' supervision, machines, methods, climate, rules and procedures) together determine the behaviour of an individual. Since, the perceived causes are the determinants of work behaviour and there are differences in the perception of the people, they behave differently in a given situation. The concept of locus of control is different from the concept of attribution. While Attribution Theory is concerned with the identification of the causes of one's own, as well as, others' behaviour, Locus of Control Theory is applicable to oneself only. Employees may perceive that their own behaviours are internally or externally controlled. Since, the external control factors (which influenced their own behaviour) are beyond their own control, employees believe that their rewards and punishments are dependent on factors like fate, luck or chance. For internal control factors, they feel they can influence their outcomes

through their own ability, skills or effort. Julian Rotter (1966) developed a twenty-three-item scale for the measurement of locus of control known as Internal-External (I - E) Scale.

### Goal Setting Theory

Edwin Locke (1968) considered two cognitive determinants of behaviour—values and intentions (goals). Emotions and desires represent the form of values and value judgements. Intentions are goals to satisfy desires or emotions (values). Goal Setting Theory results in consequences, feedback and reinforcement. The study suggests that individuals are willing to work hard when they know what is required from them. Setting specific attainable goals is related to the high level of performance.

### Miscellaneous Theories on Motivation

Apart from the theories of motivation listed above, there are certain other theories which, however, revolve around the core content or process theories. Those can be briefly discussed.

H.A. Murray (1938) discussed about Manifest Needs Theory, which is basically a multivariate approach to the structure of needs. The basic difference between Murray's formulation and formulations of Maslow and Alderfer is that Murray does not suggest a hierarchical order of various types of needs. Based on several years of clinical observations at the Harvard Psychological Clinic, Murray argues that intensities of various personality-related needs, taken together, represent a central motivating force.

R.W. White's Competence Motive Theory (1959), (quite similar to the Power Motive Theory of Adler) relates motivation to the desire of employees for mastery over physical and social environs (Cornell Study).

S. Schachter's Affiliation Motivation Theory (1959) relates motivation to the strong need for affiliation.

C. Argyris' Maturity-Immaturity Theory (1957) relates motivation to an environment which serves both the needs of the organization and the needs of the members of the organization (Yale study).

W.F. Whyte's Money Motivation Theory (1955) suggests that people are motivated primarily by the desire to make money. However, Whyte contends that monetary incentives should not be considered in isolation from other non-monetary incentives.

R. Likert and D. Katz's Michigan studies (1948) have emphasized the vital point that a productivity-motivated work-team is really a function of a particular type of supervisory style. Since, productivity has its root in the motivation of employees, it can be harnessed by carefully designing an organization, in which the individual develops a feeling that he has some importance in the organizations.

Leon C. Megginson, for the sake of our convenience, has classified the leading theories of motivation into three groups that are stated below.

- (i) **Perspective Theories:** Taylor's Scientific Management Approach, various human relations theories, McGregor's Theory Y and Theory X, which, in reality, tell management to motivate people.

- (ii) **Content Theories:** Maslow's Hierarchy of Needs Theory, Herzberg's Two-factor Theory, McClelland's Achievement Need Theory, etc., which try to identify the causes of behaviour.

- (iii) **Process Theories:** Various behaviouristic theories, which believe in stimulus-response relationship vis-a-vis motivation (e.g., Skinner's Behaviour Modification Theory) and Cognitive Theories (e.g., Vroom's Expectancy Theory and Porter-Lawler's Future-Oriented Expectancy Theory) which deal with the genesis of behaviour.

The brief discussions above regarding different motivation theories, studies and experiments, taken together, reflect our basic understanding of the concept of motivation and related aspects in a systematic manner.

Our next phase of discussion has mainly focused on the relevant Indian studies in this field in order to understand the underlying motive forces determining the behaviour and performance of the Indian employees.

In India, not many empirical studies on motivation and its related aspects have been carried out. There are some studies on the industrial workers and some on technical personnel, supervisors and managers. The most of the studies in India have attempted to find out the job-satisfaction variables, which have been construed as the motivational variables.

The first such study in India is by S.K. Bose (1951) on industrial workers and that has paved the way for other researchers to investigate into the perceived importance of job-factors to workers.

Most of the studies relating to the industrial workers, during the period 1951-1971, have rated adequate earnings, job security and personal life as the main factors which determine their behaviour.

H.C. Ganguli's study (1964) on first-line supervisors ( $N^* = 44$ ), has ranked incentive, adequate income, promotional opportunities, job security and sympathetic treatment from superiors as the important job-factors vis-a-vis motivation.

D.K. Lahiri and S. Srivastava's study (1967), on the middle-management personnel ( $N=93$ ), has ranked good organizational policies and administration, better scope for promotion, good salary, good superior-subordinate relationship and opportunity for growth as the major determinants of satisfaction.

M.P. Sawalapurkar and others' study (1968), on middle-level managers ( $N=30$ ), has ranked nine job-factors in the following order of importance: job content, opportunity for advancement, job security, superior, company, working conditions, facilities, working hours, and grievance alleviation.  $N$  indicates number of people surveyed, i.e., the sample size.

O. Padaki and A.M. Dolke's study (1970), on job attitudes of supervisors ( $N=15$ ) (based on Herzberg's Two-factor Theory), has found the lack of recognition, unfavorable superior-subordinate relationship, lack of technically-competent supervision, unfavorable organizational policies and administration and inadequate salary as the major dissatisfying factors. Another study conducted by them has also found more or less the same as perceived dissatisfaction.

G.V.S. Rao's study (1970), on bank managers ( $N=60$ ), with a view to testing the Herzberg's Two-factor Theory, has found promotion, company policies and salary on the dissatisfaction scale.

\*  $N$  - denotes the number of people surveyed.

L. Narain's study (1971), on public-sector managers (N=1213), has ranked eight factors in the following order of importance: feeling of worthwhile accomplishments, recognition, decision-making authority, opportunity for personnel growth and development, promotional opportunity, prestige of the organization in the community, pay and fringe benefits and job security. So, as far as the need-deficiencies are concerned, he has found that promotion, recognition and personal growth and development respectively show very high degrees of dissatisfaction in that order.

S.K. Bhattacharyya's study (1972), on managers (N=210), has shown lack of participation in goal-setting, inadequate pay, inadequate job-authority and 'lack of opportunity given to help people' on the dissatisfaction scale.

D.M. Pestonjee and G. Basu's study (1972), on executives (N=80), has shown promotion and growth, recognition, prestige, organizational policies and administration and autonomy as the major determinants of satisfaction.

S. Singhal and H.S. Upadhyay's study (1972) on supervisors (N=22), has also found opportunities for promotion, job security, working conditions, work group opportunities for training, competent and sympathetic supervisors, adequate income and other facilities, etc., as major motivational factors.

K.G. Agarwal (1977) has sharply criticized the Indian studies on work motivation, alleging that such researches suffer from a number of inconsistencies mainly because those have been carried out practically as a part of the job done for the employees with a view to helping them reduce production costs. Thus, the measures, suggested by such researchers, have always proved to be short-term remedies, and much-spoken-about theories on motivation have come more like fads or fashions than something substantial and lasting. Thinking in line with U. Pareek (1974), he has developed a Stratification Model of Work Motivation with variables like, social system, self-status and role. Pareek has assumed the societal system as a very important variable in the field of motivation that causes or determines that behaviour of an individual in an organization.

B.R. Sharma's study (1981), on administrators in Delhi (N = 67), has found power-motive as the main guiding force for motivation.

Sharma's study (1982), on supervisors (N = 3378), drawing samples from fifty manufacturing organizations, both in the public sector and the private sector, has obtained score values for different factors that influence motivation. The score values are presented below:

Superintendent-management relations	63.21%
Monetary benefits	60.30%
Objectivity and rationality	56.00%
Recognition and appreciation	51.32%
Welfare facilities	48.39%
Scope for advancement	47.32%
Grievance handling	45.83%
Training and education	43.46%
Participative Management	39.68%

The study has been carried out on a three-point scale—low, medium and high frequencies.

S. Neelamgham and D.K. Vald's study (1986), on motivation of the sales force (N=116), has found the highest need-deficiencies with respect to prospects of promotion and recognition for good work.

It is important to note that the major Indian studies are on supervisory and managerial personnel. Another important feature of the Indian studies is that most of the studies have been carried out with a small sample, using only conventional methods like ranking, percentage calculation, etc. Some studies have been carried out simply to authenticate Herzberg's Two-factor Theory, while some others are highly opinionated studies without much adherence to the norms of sampling and survey methods. Even, in most of the cases, suitable structured close-ended questionnaire was not administered. Those are simple inferences after informal discussions with the samples, mostly drawn without following any proper sampling procedure. Another feature is that most of the studies are based on experiences of single industrial units. Representative results are difficult to obtain from a survey based on a small sample drawn from a single unit.

### Motivation and Morale

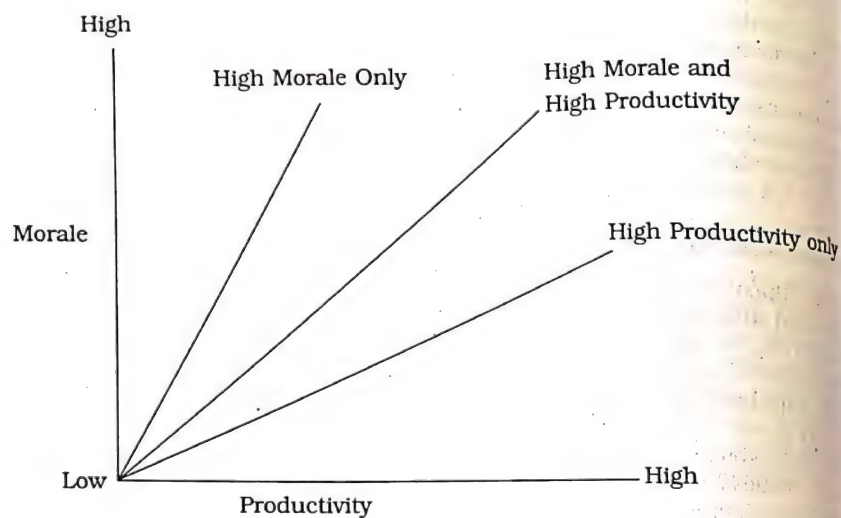
Edwin Flippo (1961) defined, morale as '... a mental condition or attitude of individual and groups which determine their willingness to cooperate.' Yoder Dale (1972), on the other hand, explained morale as 'the overall tone, climate or atmosphere of work perhaps regularly sensed by the members. If workers appear to feel enthusiastic and optimistic about group activities, if they have a sense of mission about their job, if they are friendly with each other, they are described as having a good or high morale. If they seem to be dissatisfied, irritated, cranky, critical, restless and pessimistic, they are described as having poor or low morale.' Elton Mayo defined it as 'the maintenance of cooperative living', which means a sense of belongingness. On the other hand, many authors defined morale as a 'pursuit of a common purpose', attitude, individual and group job satisfaction, participative attitudes, team spirit, etc. Whatever may be the way of defining, it is evident that morale is a cognitive concept, encompassing feelings, attitudes and sentiments, which together contribute to a general feeling of satisfaction in the workplace.

Like morale, motivation is also a cognitive concept but it is different from morale on certain important aspects. Motivation stimulates individuals into action to achieve desired goals. It is, therefore, functions of need and drives. It mobilizes energy, which enhances the potential for morale. Morale on the other hand, is the individual or group attitude towards a particular subject. It contributes to general feeling of satisfaction at the workplace. It is, therefore, is the function of freedom or restraint towards some goal. It mobilizes sentiments, which form an important part of organizational climate. Attitudes and sentiments, i.e., morale, *per se*, affect productivity. High morale is an index of good human relations, which, *inter alia*, reduces labour turnover, absenteeism, indiscipline, grievances, etc.

Factors which affect morale are primarily attitude and job satisfaction level of individual employees. We have discussed about attitude and its measurement, in chapter on 'Recruitment, Selection and Induction'. From the organizational

point of view, such factors can be delineated into, organizational goals, leadership style, attitude of co-workers, nature of work, work environment and the employee himself.

High morale is, conventionally, considered as a contributor to high productivity, but such correlation may not be always true. This is because the high productivity may be the outcome of many other organizational initiatives, which may be independent of employee morale. Hence, even with low employee morale, high productivity is achievable. This can be illustrated using the model of Prof. Keith Davis, which goes as follows:



Cause Group	YEARS							
	1994		1995		1997		1998	
	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total
Wages and Allowances	354	29.4	320	30	305	23.4	233	21.2
Personnel	194	16.2	195	18.3	261	20.0	175	16.0
Retrenchment	19	1.6	10	0.9	7	0.5	8	0.7
Lay-off	3	0.2	4	0.4	7	0.5	6	0.6
Indiscipline	185	15.2	145	13.6	246	18.9	225	18.9
Violence	20	1.7	14	1.3	13	1.0	7	0.6

(Continued)

Cause Group	YEARS							
	1994		1995		1997		1998	
	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total	No. of dis-putes	Percent-age to total
Leave and Hours of Work/shift Working	17	1.4	21	2.0	31	2.4	14	1.3
Bonus	92	7.8	79	7.4	112	8.6	123	11.2
Gherao	1	0.1	1	0.1	-	-	-	-
Non-Implementation of Agreements, Awards, etc.	37	3.1	43	4.0	43	3.3	32	2.9
Charter of Demands	55	4.6	61	5.7	68	5.2	97	8.8
Workload	10	0.8	10	0.9	9	0.7	6	0.6
Surplus Labour	1	0.1	-	-	1	0.1	-	-
Betterment of Amenities	16	1.3	18	1.7	34	2.6	12	1.1
Suspension/Change of Manufacturing Process	1	0.1	-	-	-	-	1	0.1
Standing Orders/Rules/Service/Conditions/Safety Measures	50	4.2	52	4.9	34	2.6	13	1.2
Others	118	9.8	57	5.4	85	6.5	89	8.1
Not Known	21	1.7	29	2.7	37	2.8	49	4.5
Total	201	100	1066	100	1305	100	109	100

Source: Various Year Books on Indian Labour

The table indicates the pattern of industrial relations problems in terms of various casual factors. Analysing this trend, we can understand the pattern of motivation or demotivation factors in India. From this pattern, it is interesting to observe, wage-related disputes are still highest in India, followed by indiscipline and other casual factors. Therefore, it is important to go through these aspects carefully to nurture the proper motivating environment in the workplace.

## SUMMARY

Motivation is a dynamic HR process and there cannot be any organization-specific motivational tool. The content and process theories on motivation suggested various methods of enhancing employee motivation. Many empirical studies carried out in India and abroad, validated such tools, either partially or in its entirety. Motivation, either through intrinsic or extrinsic reinforcers, contributes to employee satisfaction, thus enhancing performance and productivity.

## Key Words

**Esteem Needs:** It pertains to self-respect and respect or esteem from others. Self-respect is ensured by achieving competence, confidence, personal strength, adequacy, achievement, independence and freedom. While respect from others come from prestige, recognition, acceptance, attention, status, reputation and appreciation.

**Job Characteristic Model:** Based on Richard Hackman and Greg Oldham's study (1975) of Herzberg's Two-factor Theory. The model shows how a good job design can lead to internal motivation of the employees and contribute to better job performance. Five job characteristics, which lead to employee motivation are, skill variety, task identity, task significance, autonomy and feedback.

**Equity Theory:** The theory proposes that in a work environment, motivation is influenced by one's perception of how equitably he or she is treated compared to others. The theory is also known as 'social comparison theory' or 'inequity theory'.

**Goal Setting Theory:** The theory considers two cognitive determinants of behaviour: values and intentions (goals). Emotions and desires represent the form of values and value judgements. Intentions are goals to satisfy desires or emotions (values). The theory results in consequences, feedback and reinforcement. The study suggests that individuals are willing to work hard when they know what is required from them. Setting specific attainable goals is related to high level performance.

**Performance Satisfaction Theory:** The theory postulates that performance leads to satisfaction, contrary to the belief that satisfaction leads to performance.

**Attribution Theory and Locus of Control:** This theory is mainly concerned with the cognitive process by which an individual interprets behaviour attributing to certain parts of the relevant environment. An individual for his own behaviour or for others' behaviour interprets such casual relationships or attributes.

## REVIEW QUESTIONS

1. Define the term motivation. Why is it so important for HR managers?
2. What motivational tool would you like to use for knowledge workers? Would your approach be different for operators in a shop floor?
3. Critically review the contribution of Maslow and Herzberg in theories of motivation. Do you think they have any relevance for the new generation workers?
4. How do you distinguish process theories and content theories of motivation?
5. Distinguish between motivation and morale. Discuss how could morale influence productivity?

6. Can motivation be defined as perception? State are the circumstances, when perception can influence motive strength of a worker.

Short Notes:

- (a) Job Satisfaction
- (b) Performance Satisfaction Theory
- (c) Motivation and Morale
- (d) Employee Stock Options
- (e) Theory of Expectancy
- (f) Motivation and Productivity

## REFERENCES

1. Agarwal, K.G. 1977. 'Self, role, status and motivation: Towards stratification theory of work motivation'. *Indian Journal of Industrial Relations* 10(3): 379-86.
2. Atkinson, John W. 1966. *An Introduction to Motivation*. New Delhi: Affiliated East-West Press.
3. Bhattacharyya, Dipak Kumar. 2007. *Human Resource Research Methods*. New Delhi: Oxford University Press.
4. Bhattacharyya, Dipak Kumar. 2006. *Human Resource Management*, 2nd Edition. New Delhi: Excel Books.
5. Bose, S.K. 1951. 'Man and His Work'. *Indian Journal of Psychology* 26: 1-20.
6. Ganguli, H.C. 1964. *Structure and Process of Organisation*. Mumbai: Asia Publishing House.
7. Herzberg, F., Manser, B., and Synderman. 1967. *The Motivation to Work*. New York: John Wiley and Sons.
8. Lahiri, D.K., and S. Srivastava 1967. 'Determinants of Satisfaction in Middle Management Personnel'. *Journal of Applied Psychology* 3: 251-65.
9. Narain, L. 1971. 'Managerial Motivation in Public Enterprises'. *Lok Ydyog* 9: Pp. 861-75 and pp. 883.
10. Neelamegham, S., and D.K. Vaid. 'Sales Force Motivation: Challenging Task'. *Indian Management* 25(12): 21-25.
11. Padaki, O., and A.M. Dolke. 1970. 'A Study of Job Satisfaction of Indian Executives'. *Indian Journal of Industrial Relations* 8: 3-16.
12. Pareek, U. 1974. 'A Conceptual Model of Work Motivation'. *Indian Journal of Industrial Relations* 10(1): 15-23.
13. Rao, G.V.S. 1970. 'Determinants of Job Satisfaction in Managerial Personnel'. *Indian Manager* 1: 55-62.
14. Sharma, B.R. 1986. *Motivational Crisis in Indian Administration: A Case Of Existential Sickness*. New Delhi: Indian Institute of Public Administration.
15. Singhal, S., and H.S. Updhyay. 1972. 'Psychology of men at work: Employees perception of job incentives'. *Indian Journal of Industrial Relations* 8: 17-30.
16. Swalapurkar, M.P., et al. 1968. 'Job Motivation of Middle Managers'. *Indian Journal of Applied Psychology* 5: 7-10.
17. Vroom, V. H. 1964. *Work and Motivation*. New York: Wiley.
18. Whyte, W. F. 1955. *Money and Motivation*. New York: Harper and Row.

# Leadership

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend the theories of leadership
- understand the difference between a leader and a manager
- know different styles of leadership
- realize why leadership is essential for managing organizational behaviour
- understand the process of development of leadership ability in organization

## INTRODUCTION

Tracing history, we find the usage of the word 'leader' in English language that dates back to 1300s. The term originates from the root word 'leden', which means to travel or to show the way. The last part, i.e., to show the way, is more appropriate for leaders, as leaders give direction. Even though the term 'leader' was used so early in the history, the usage of the term 'leadership' is of recent origin. The scientific study on leadership was primarily done in the United States.

Political science, psychology, education, history, agriculture, public administration, management, anthropology, biology, military sciences, philosophy and sociology have contributed extensively to understand the term leadership and its various sub-fields. Almost in every culture, we find the use of the term leadership. The most significant study on the leadership history was carried out by Joseph Campbell. According to Campbell, 'Essentially, there is but one archetypal mythic hero who is the founder of something—a new age, a new religion, a new city, a new way of life. In order to find something new, one has to leave the old and go in quest of a new thing, ... It involves a journey—abandoning the old and searching for the new.' According to Bolman and Deal,

leadership arises to respond to a need. It is more for dealing with the uncertainties and dangers in-built with human condition.

Conditions to develop leadership situation is time specific, and it varies from situation to situation. To take an example, the style of leadership is different at the shop floor or at the operational level.

It exists in the relationships, Imagination and the perception of followers. Thus, leadership goes among people and not something within. The general disagreement over the meaning and contexts of leaderships is quite extensive. However, there exists a common agreement that leadership is the major enabler for the effectiveness of any organization. Effective leadership can solve most of the organizational problems.

## DEFINITIONS AND CHARACTERISTICS

We have already explained the complexities involved in ideally defining leadership, a leader and a follower. B. Raven and J. Rubin (1976) defined a leader as 'someone who occupies a position in a group, influences others in accordance with the role expectation of the position and coordinates and directs the group in maintaining itself and reaching its goal.'

Sears (1988) defined the leader as '... the one who initiates action, gives order, makes decisions, settles disputes between group members, offers encouragement, serves as a model, and is in the fore-front of group activity.' Therefore, the leader is the person, who exerts influence on behaviour and beliefs of the people working in the organization.

G. Avery, and E. Baker (1990) defined leadership expanding this concept as a 'process of influence between a leader and his followers to attain group, organizational and societal goals.' Let us now consider a few more definitions of leadership. George R. Terry (1960) defined leadership as '... the relationship in which one person, the leader, influences others to work together willingly on related tasks to attain that which the leader desires.' Lyne Joy McFarland, Larry E. Senn and John R. Childress (1994) have defined it 'as a process of interpersonal influence by which the executive or manager influences the activities of others in choosing and attaining given ends.' Harold Koontz, Cyril O'Donnell, and Heinz Wehrich (1993) defined leadership 'as the art or process of influencing people so that they will strive willingly and enthusiastically toward the achievement of group goals.' Robert Tannenbaum, I.R. Weshler and F. Massarik defined it '...as a process of interpersonal relationships, through which a manager attempts to influence the behaviour of others toward the attainment of pre-determined objective.' Keith Davis, on the other hand, defines it as '...the ability to persuade others to seek defined objectives enthusiastically. It is the human factor which binds group together and motivates it towards goals.' Reviewing the above definitions, we can define leadership, therefore, as a process of influencing people for achieving organizational goals.

Based on above definitions, we can list the characteristics or of leadership as follows:

### It Is a Personal Quality

This quality makes other people to follow a leader. Quality of a leader is the aggregation of his intelligence, communications skills, emotional balance, inner

drive, energy and other managerial skills like, conceptual, technical, human relations, etc. To make others to follow or to exert others to do the work, requires the presence of all these qualities. The degree of requirement of these qualities will, however, depends on the situation.

### It Is a Process of Influencing Others

Through the process of influence only a leader makes others to work for achieving goals. People may lack initiative or the urge to do the work and may get demotivated. Such behavioural characteristics can seriously impede the achievement of organizational objectives. However, a good leader through his influence can turn the situation in his favour and make people work towards achieving goals.

### It Regulates Individual Behaviour

Individual behavioural attributes may stand against achieving group goals. A leader through his process of influence can regulate the individual behaviour and make an individual to submit to group norms. To illustrate, following an approach of 'Discipline without Punishment', as advocated by John Huberman, a leader can correct the indisciplined behaviour of an individual and transform him as a good performer.

### Existence of Relationship between Leaders and Followers

A leader succeeds by developing relationship with his followers. He cannot flourish in a vacuum. Due to this reason, the other way of referring to leadership is followership. In order to develop such relationship, a leader has to gain the confidence. This is done by developing a two-way relationship, through effective interpersonal relationship and also through participative decision making, i.e., taking decision by group consensus.

### It Is a Continuous Process

Leadership is not one-time influence of subordinates or followers. In order to be a good leader, a manager should sustain the leadership continuously. Hence, once a leader does not warrant always a leader.

### Leadership Is Situational

Leadership is exerted in a situation, which varies from time to time. Responding to varying situations requires different leadership approach. One situation may require to take a lenient view, whereas, the other may require to be tough. In order to remain competitive in the industry, organizations need to respond to changes and that too swiftly. This requires leaders to change their approach and develop multi-skills and abilities, so as to come out as winners.

Another way of identifying characteristics and features of leadership was suggested by Bolman and Deal. They have listed four important characteristics of leadership as follows:

- (i) Ability to get others to do what an organization wants. It means the power to make others work towards achieving organizational goals
- (ii) Motivate people to get things done mostly through persuasion

- (iii) provide a vision
- (iv) Empower people to do what they want

## LEADERSHIP AND MANAGEMENT

A good leader may be a poor manager but it helps a manager to be successful if he is a good leader. Warren Bennis and Bert Nanus (1997) suggested that 'managers do things right, and leaders do the right thing.' Yet, the terms *managers* and *leaders* are used interchangeably. However, leadership and managership are not same. We find the existence of leadership in unorganized groups also. However, managership exists only in organized and structured groups. A manager is more than a leader. Due to his positional role, a manager has to organize and control the activities of people towards the accomplishment of objectives. As a manager, one has to perform all functions of management, but as a leader one is more related to the directing part, i.e., influencing people to achieve goals. Therefore, leadership is a part of management and not the whole of management. That is why, we often say 'All managers are leaders but all leaders are not managers.'

To stretch the debate further, let us examine views of major contributors in this regard. Their main contentions are that leaders and managers vary in their orientation towards goals, conceptions about work, interpersonal style and self-perceptions. W.L. French (1987) while distinguishing between a leader and a manager opined that:

*Leaders ... are often dramatic and unpredictable in style. They tend to create an atmosphere of change, ferment even chaos. They are often obsessed by their ideas, which appear as visionary and consequently excite, stimulate and drive other people to work hard to create reality out of fantasy... managers are typically hard-working, analytical, tolerant and fair-minded. They have a strong sense of belonging to the organization, and take great pride in perpetuating and improving the status quo.*

Another opposing view states that leadership is just one aspect of what a manager does. Leaders are only involved in influencing subordinates towards the achievement of organizational goals.

Robert P. Vecchio (1988) pointed out that leadership can exist on a formal or informal basis.

We can summarize such differences between leadership and managership with a quote from John Kotter (1991). It summarizes the points already highlighted in this review of the topic and is a worthy conclusion to the discussion:

*Leadership is different from management, but not for the reason most people think. Leadership isn't mystical and mysterious. It has nothing to do with having Charisma or other exotic personality traits. It's not the province of a chosen few. Nor is leadership necessarily better than management or a replacement for it. Rather, leadership and management are two distinctive and complementary activities. Both are necessary for success in an increasingly complex and volatile business environment.*

Management functions include planning, organizing, staffing, directing and controlling. In order to direct his subordinates, a manager must motivate, communicate, supervise, guide and lead them. Thus, it is in his directing function

that a manager becomes responsible for effectively and successfully leading his subordinates. Managing can be more effective if those who manage are also the leaders, because leadership can substantially influence the results. Since, a part of manager's job involves getting things done through the efforts of other people, he will be more successful in the job if he is also a skilful leader. Following are the favourable results that are produced if managers are also good leaders:

- (i) The leader guides and directs by eliminating uncertainties as to what should be done, and thus, coordinating individual efforts so as to make them pull in one direction.
- (ii) The leader motivates people and integrates individual needs with the needs of the organization.
- (iii) The leader represents the group to the outside world and the outside world to the group. Leader is looked upon by the group as a source of information and satisfaction.

Three things provided by the leader, as mentioned above, are also referred to as direction, drive and representation and sufficient to prove that leadership is an essential part of successful management. It is, however, argued that since managers have authority to provide incentives, or has the authority to deprive or otherwise punish people in the organization, the management leadership is more potential than real. Discipline and conformity can be maintained through the hierarchy and the fear of loss of employment. However, leadership should not be emphasized so as to make it synonymous with management. It will improve the results if the manager is also a skilful leader. However, a leader need not be a good manager as managing involves more than mere leading and a manager can do reasonably well even when he is not a good leader. Leadership, therefore, is better considered as one of the significant prerequisites to managerial effectiveness.

From the above discussions, we can differentiate between management and leadership as follows:

Managers	Leaders
1. A manager is more than a leader. Hence, management is a wider term	1. A leader need not be a manager. Leadership is a narrow term
2. A manager fits in an organized structure	2. A leader may be in an informal group also
3. A manager exercises different functions of management to achieve group goals	3. A leader exerts influence on people whom he leads, to achieve group goals
4. Authority of a manager stems from his positional role, i.e., it is delegated from the top	4. A leader earns his authority by virtue of his skills, knowledge and abilities
5. To be a successful manager, the manager has to be a good leader	5. Leaders need not be managers

## FORMAL AND INFORMAL LEADERS

The organizational structure is characterized by the hierarchy of positions, which are manned by individuals in the scalar chain. Officially, every manager enjoys power to lead and secure support of his subordinates. Managers are then leaders because they have the formal authority to direct, motivate and lead people. This kind of leadership is known as formal or managerial leadership. Informal leaders are not delegated any authority to lead; rather, they acquire such authority as to guide and lead. Informal leadership is spontaneous and is a part of informal organization. If properly handled, informal organization offers a good training ground for formal leaders to develop and test their leadership skills.

## SIGNIFICANCE OF LEADERSHIP

From the meaning, characteristics and difference between leadership and management, we can understand how leadership is important for an organization. We can list such importance of leadership as follows:

### It Improves Motivation and Morale of Employees

A successful leader influences the behaviour of an individual, which enhances the involvement of individual employee to work. By creating confidence in employees and sustaining their enthusiasm and involvement in achieving organizational goals, it enhances the motivation and morale of employees. Even in a situation of crisis in an organization (viz., when an organization faces a bad phase in terms of profitability due to market slowdown or other reasons), a leader can sustain the high level of commitment and motivation from employees, which may ultimately help an organization to turn around. That is why good leaders are considered as turnaround agents in an organization.

### It Leads to Higher Performance

Leadership pulls the group to strive for results, i.e., achieving organizational goals. With the increased level of commitment and motivation, a good leader, therefore, leads to higher performance of employees. Higher performance leads to increased productivity, which results to increased profitability, even in a competitive market.

### It Is an Aid to Authority

Leadership is a process of influencing others. The mere use of authority by managers may not lead to results. However, when managerial authority is enriched with good leadership, employees start cooperating. Therefore, the formal exercising of authority may not result to success. Authority with leadership brings success to the organization.

### It Determines Organizational Success

In the process of unification of group efforts to achieve organizational goals, the leadership enhances organizational effectiveness. Good manager alone cannot achieve this.

### It Helps to Respond to Change

Organizations today need to respond to changes quickly. A change in the technology, process, methods, plans (including strategic plans) always encounter resistance from people working in organizations. Leadership can play a great role in implementing change in organizations by creating a conducive environment. People follow leaders; they like to emulate the examples set by leaders, which, therefore, makes the change process smooth and successful.

### It Inculcates Values in Organization

A value-based organization gets increased commitment and loyalty from employees. A good leader being inspirational also successfully percolates human values, which shape the attitude of the employees towards work.

## PRINCIPLES OF LEADERSHIP

Basic principles of leadership can be grouped as follows:

### Must Know Himself and Continuously Seek Self-improvement

To know self, one has to understand attributes like, *be*, *know* and *do*. Seeking self-improvement means continually strengthening such attributes, which can be accomplished through reading, self-study, classes, etc.

### Be Technically Proficient

As a leader, one must know his job and the job of his followers.

### Must Seek Responsibility and Take Responsibility for His Actions

Leader must guide his organization to new heights. In the process of guiding, things may at time go wrong. He must not blame others for the situation, rather, must take the responsibility himself. He must analyse the situation, take corrective action and move on to the next action.

### Must Make Sound and Timely Decisions

Using problem-solving, decision-making, planning and various controlling tools, a leader must make sound and timely decisions.

### Must Set the Example

A leader is a role model for his followers. He must not only hear what he is expected to do, but also see.

### Must Know People and Think about Their Well-Being

Leader must know the nature of his followers and must be nurturing and caring for them.

### Must Keep Followers Informed

Transparency in information enhances commitment from the followers. Hence, a leader must know how to communicate and keep his followers informed.

### Must Develop a Sense of Responsibility in Followers

Development orientation requires inculcating good character traits within followers, which will help them to carry out their professional responsibilities.

### Must Ensure Tasks Are Understood, Supervised and Accomplished

This also requires transparent communication with followers.

### Must Train Followers as a Team

Inculcating team spirit and culture in the followers enable a leader to accomplish the organizational goals. Hence, this is also considered as one of the important principles of leadership.

### Must Develop Full Capabilities of Organization

A leader by developing a team spirit, develops an organization to its fullest capabilities.

## FACTORS OF LEADERSHIP

The four major factors of leadership are:

### Follower

Different people require different styles of leadership. To take an example, a newly recruited person requires more supervision than an experienced one. Similarly, a follower with a poor motivation requires a different approach than one with a high degree of motivation. Thus, the fundamental starting point is to have a good understanding of human nature: needs, emotions and motivation. *Leader must know his followers' be, know and do attributes.*

### Leader

One must have a honest understanding of what one is, what one knows and what one can do. Also, it is to be noted that it is the followers not the leader who determine whether a leader is successful or not. If a follower does not trust his leader or lacks confidence in a leader, then he will remain uninspired. Hence, to be successful, a leader has to convince followers not himself or his superiors.

### Communication

A leader leads through a two-way communication. Communication need not always be verbal, it may be non-verbal also. For instance, through personal selling (his own behaviour) a leader *sets the example*. A leader should not ask his followers

to perform anything that he himself would not be willing to do. What and how a leader communicates either builds or harms the relationship between the leader and his followers.

### Situation

All situations are different. What one does in one leadership situation may not always work in another situation. A leader must use his judgment to decide the best course of action and the leadership style needed for each situation. To take an example, one may need to confront an employee for inappropriate behaviour, but if the confrontation is too late or too early, too harsh or too weak, results may be disastrous.

### Environment and Leadership

Every organization has a particular work environment that dictates to a considerable degree how its leaders respond to problems and opportunities. This is brought about by a heritage of its past leaders and its present leaders. Leaders exert influence on the environment by three types of actions:

- Goals and performance standards they establish
- Values they establish for the organization
- Business and people concepts they establish

Successful organizations have good leaders who set high standards and goals such as strategies, market leadership, plans, presentations, productivity, quality and reliability.

Values reflect the concern the organization has for its employees, customers, investors, vendors and surrounding community. These values define the manner in which the business should be conducted and what type of business the organization should engage in.

Concepts define what products or services the organization will offer and the methods and processes for conducting business.

These goals, values and concepts make up the organization's 'personality' or how the organization is observed by both outsiders and insiders. This personality defines the roles, relationships, rewards and rites that take place in the organization.

Roles are the positions that are defined by a set of expectations about the behavior of any newly recruited person. Each role has a set of tasks and responsibilities that may or may not be spelled out. Roles have a powerful effect on the behavior of employees because money is paid for the performance of the role; there is prestige attached to a role; and there is a sense of accomplishment or challenge, etc.

Relationships are determined by tasks. Some tasks are performed alone, but most are carried out in relationship with others. The tasks will determine who the role holder is required to interact with, how often and towards what end. Also, the greater the interaction between the both parties, the greater the chance of liking each other. This, in turn, leads to more frequent interaction. In human behaviour, it is hard to like someone whom we have no contact with, and we tend to seek out those we like. People tend to do what they are rewarded for, and friendship is a powerful reward. Many tasks and behaviours that are associated with a role are

brought about by these relationships. That means, new task and behaviours are expected of the present role holder because a strong relationship was developed in the past, either by the present role holder or by a past role holder. There are two distinct forces that dictate how to act within an organization:

### Culture and Climate of Leadership

Each organization has its own distinctive culture. It is a combination of the founders, past leadership, current leadership, crises, events, history and size. This results in rites: the routines, rituals and the 'way we do things.' These rites influence the individual behaviour on what it takes to be in good standing (the norm) and direct the appropriate behavior for each circumstance.

The climate is the feel of the organization, the individual and shared perceptions and attitudes of the organization's members. While the culture is the deeply rooted nature of the organization that is a result of long-held formal and informal systems, rules, traditions, and customs, the climate is a short-term phenomenon created by the current leadership. Climate represents the beliefs about the 'feel of the organization' by its members. *This individual perception of the feel of the organization comes from what the people believe about the activities that occur in the organization.*

Organizational climate is directly related to the leadership and the management style of the leader, based on the values, attributes, skills and actions, as well as, the priorities of the leader. The ethical climate then is the 'feel of the organization' about the activities that have ethical content or those aspects of the work environment that constitute ethical behaviour. The ethical climate is the feel about whether things are done right or the feel of whether employees behave the way they ought to. The behaviour (character) of the leader is the most important factor that impacts the climate.

On the other hand, culture is a long-term, complex phenomenon. Culture represents the shared expectations and self-image of the organization—the mature values that create 'tradition' or the 'way we do things here.' Things are done differently in every organization. The collective vision that defines an institution is a reflection of its culture. Individual leaders cannot easily create or change culture because culture is a part of the organization. Culture influences the characteristics of the climate by its effect on the actions and thought processes of the leader. However, everything a leader does will have an effect on the climate of the organization.

### FUNCTIONS OF LEADERSHIP

Leadership is a means of directing. It represents that part of an executive's activities by which he guides and influences the behaviour of his subordinates and the group towards some specified goals by personally working with them and understanding their feeling and problems. In recent years, management experts, psychologists, sociologists and behavioural scientists have tried to identify the functions of leadership in varied ways and from different view points. Let us analyse some of the views in brief.

### Sociological View

Among the sociologists, who want to go into the deep to study the functions of leaders, the opinion of P. Selznick (1957) may be considered as the most appropriate. He had viewed leadership function in setting goals, shaping and reshaping organization and reconciling internal and external forces. In fact, it is creative function of the leader that calls for viewing and reviewing organizational environment, work accomplishment and determining near and remote goals in the above perspective.

The review of the work of other sociologists highlights that the leader is supposed to build goals and determine policies into the social structure of the enterprise. It is his fundamental duty to see that the enterprises do not mere survive; it grows into stature. Leaders should be in a position to read the desired changes, movement and functions of the enterprise to get it placed in the industrial complex. Another important function, however, is to manage and mitigate internal conflict. It is a hard fact that conflict is imminent in big organization due to diverse opinions, views, beliefs and values. The effectiveness of leaders lies in their endeavour to win the consent of several groups and put them to work in accomplishing the objective and the enterprise mission in the ultimate analysis.

### Psychological View

In the opinion of psychologists, people will best respond in terms of output if the organization provides opportunities for them to appraise and appropriate their basic, social and ego needs. As a matter of fact, one of the basic functions of the managers and executives or leaders in other words, is to devise the necessary motivational system to meet their needs. It should, however, be kept in view that though the above arrangement is sound from the view point of motivation, it is not adequate to outline the scope of their psychological needs, in precise, for the exercise of leadership on the part of the management.

### Other Views

Management experts, of late, have given a lot of attention in identifying the exact function of leadership. From the study of management experts, leadership function can be viewed as (i) directing, (ii) responding and (iii) representing. The eminent scholar Leonard Sayles viewed directing as the primary function of leadership. In big organizations where divergent views and number of groups exist, it is essentially through the means of *directing* that all of them are unified and coordinated for a central purpose. In this matter, of course, managers and executive have to take the required initiative with intelligent approach and rational attitude.

Management experts consider *responding* as the second function of leadership. It signifies responsiveness to the initiations of subordinates. It may often be noticed that subordinates sometimes ask for guidance, assistance, advice and help from their superior. Moreover, subordinates always want to be assured to get their best rewards for the services rendered. Leadership quality helps superior to appraise the needs of their subordinates and meet them intelligently.

The other essential function of leadership is *representing*. It signifies that superiors would properly and effectively represent the interests of the total group

among their peers and to the higher level in the managerial hierarchy. This aspect of thought on the part of subordinates may vary. It may commonly be observed where subordinates initiate action that requires to be accomplished by their superiors or the higher-level personnel. In fact, leadership quality enables the executives to represent such group effort and get positive response.

Effective leadership undoubtedly creates a well-to-do environment among the employees not only by the influence of the leader but also his responsiveness to their problems, feelings, aspirations and ambitions. On the other hand, it enhances the image of the organization to the outside world.

From the above discussions, we can list the functions of a leader as follows:

- To develop teamwork in organizations
- To act as an important change agent in organizations
- To balance the use of power
- To act as representative of subordinates
- To be a counsellor to employees
- To help the employees to optimally utilize their time
- To help in achieving organizational effectiveness
- To enhance the level of motivation and morale for employees
- To inculcate human values in organization
- To increase level of commitment and loyalty of employees towards the organization

### LEADERSHIP AND POWER

Power, in the case of leadership, is divided into six categories; however, each can be linked with another, as they are interrelated. *Expert* and *Informational* power are concerned with skills, knowledge and information, which the holders of such abilities are able to utilize to influence others, i.e., technicians and computer personnel. *Reward* and *Coercive* power, differ from the previously mentioned, as they involve the ability to either reward or punish persons being influenced, in order to gain compliance. *Legitimate* power, is the power, which has been confirmed by the very role structure of the group or organization itself and is accepted by all as correct and without dispute, such as in the case of the armed forces or the police force. *Referent* power, on the other hand, involves those being influenced, identifying with the leader, i.e., rock or film personalities using their image to enter the political arena.

Most leaders make use of a combination of these six types of powers, depending on the leadership style used. *Authoritarian* leaders, for example, use a mixture of *legitimate*, *coercive* and *reward* powers, to dictate the policies, plans and activities of a group. In comparison, a *democratic* or *participative* leader would use mainly *referent* power, involving all members of the group in the decision-making process.

### LEADERSHIP STYLES

The problem of leadership style is basically concerned with deciding the extent to which a manager should be dictatorial and the extent to which he is supposed to be participative or consultative. Different leadership styles can be categorized as follows:

- (i) Authoritarian or leader-centred or autocratic style
- (ii) Democratic or participative or consultative or group-centred style
- (iii) Laissez-faire or free-rein style
- (iv) Paternalistic leadership

### Autocratic Style of Leadership

This type of leader is characterized by the centralization of decision-making authority in the leader and very limited participation by subordinates of the group. The autocratic leader accomplishes the results through the use of authority, fear of deprivations, punishment and other coercive measure. Since it is negative in character, authoritarian approach will succeed only in the short run and will fail to induce subordinates for better performance in the long run. Resentment, absenteeism and higher turnover rate for employees are some of the most natural consequences of this approach. Still, autocratic style deserves consideration because of following reasons:

- (a) There may be very little time for participation, particularly in a situation of crisis
- (b) Confidential matters may not permit normal consultation
- (c) Leader may have more knowledge, and he may compensate for participation

### Democratic Style of Leadership

This is characterized by allowing substantial participation of the members of the group in management and decision-making process of the leaders. Subordinates are frequently consulted by the manager for wide-ranging problems, and they are also allowed sufficient freedom to communicate with the leader and also with their fellow subordinates. Democratic style of leadership is based upon the positive assumption about human beings. It encourages cooperative spirit and development of subordinates for higher responsibility. This style of leadership substantially contributes to the satisfaction on the part of subordinates.

### Laissez-faire Style of Leadership

Under this style, the leader depends largely upon the group and its members to establish their own goals and make their own decisions. The leader is passive and assumes the role of just another member of the group. Tasks are assigned in general terms. Laissez-faire approach is meant for selective application. If the subordinate is intelligent, highly qualified and experienced and desires self-fulfilment, a manager may follow this approach without much risk. This style of leadership is, therefore, confined to a small creative or developmental group.

### Paternalistic Leadership

This type of leader assumes his function like a father. He treats his followers as members of his family and guides them as the head of the family. He likes to help his followers to do the work and to guide, protect and keep them happy to work as family members. This type of leader always tries to provide his followers good working conditions, fringe benefits and employee services. Obviously, because

of the difference in style, followers under this style of leadership work harder to accomplish the job.

A manager is not always free in the choice of the leadership style most appropriate to him under a given situation. Feelings and attitudes long cherished are difficult to change. Though, under the democratic style of leadership, an organization works better as a pattern of general purpose, the manager should be able to occasionally switch to the autocratic style so that people are effectively led. In general, the choice of the pattern or style of leadership depends upon following factors:

- (a) Skill, personality and values of the manager himself
- (b) Forces dominating the subordinates like subordinate's expectations, aspirations, needs and values
- (c) Situations such as type of structure, clarity or ambiguity in defining work and objectives, nature of the problems and the pressure of time
- (d) People in the group, e.g., differences in education, interest, motives, loyalty and the like

Thus, leadership style varies with different leaders, subordinates and situations.

### LEADERSHIP ATTITUDES

In order to improve manager's ability to lead, certain attitudes need to be cultivated. These are generally identified as empathy, objectivity and self-knowledge.

#### Empathy

It is generally described as the ability of a person to look at things or problems from another person's point of view. It involves projecting one's self into the position of the subordinates who are being directed and led. Manager should not assume that subordinates will understand the things and problems as he himself perceives them. People differ in their experiences, ability and understanding of things. Each has his own value system and attitudes. Thus, in order to understand their feelings and problems and to lead them successfully, a manager should put himself in the position of his subordinates.

#### Objectivity

In his task of leading, a manager should not be guided by any preconceived notions about the attitude and behaviour of his subordinates. Problems and their causes should be observed very objectively and unemotionally. Thus, a manager should not be annoyed with his subordinates simply because results are poor or change is resisted. He must observe the things as they are and analyse them very objectively. It is only when a manager is objective and detached in his behaviour towards the members of the group, he would be able to assess their feelings and problems and guide them properly. However, this behaviour needs to be learnt.

#### Self-Awareness

A manager may think himself to be fair and objective but subordinates may think otherwise. The manager should, therefore, know for himself how he appears to others and the effect of his attitude and behaviour on his subordinates. This would

help him lead in a pattern as perceived by those who are being led. Self-knowledge would help the leader to improve and cultivate those habits and attitudes that produce favourable response on the part of the subordinates. For instance, if self-awareness leads him to learn that instructions are not properly understood, the manager can attempt to improve his ability to communicate.

### LEADERSHIP SKILL

As a leader, one has to play many roles in an organization to achieve the intended goals and objectives. What skill sets are important is difficult to define. But from a general perspective, we can classify the degree of requirement of such skill sets as under:

- (a) Human Skill
- (b) Conceptual Skill
- (c) Technical Skill
- (d) Personal Skill

#### Human Skill

In order to get cooperation of his followers, a leader has to successfully resolve many people-oriented issues than job-related issues. He must understand human behaviour, know their needs, sentiments, emotions, motivations and their contemplated actions and reactions to a particular situation. Therefore, without human relation skills, which emphasize more on understanding the people, one cannot be a successful leader. We have already discussed two essential skills requirement, i.e., empathy and objectivity, while explaining leadership attitude. These apart, a good leader also should have communication, teaching and social skills, all of which form the part of human skills. A leader should have good communication skills to be able to persuade, inform, stimulate, direct and convince the followers. Communication is the transfer of information in the form of an understandable message. It helps in establishing and disseminating the goals of an enterprise. It also enables the leader to create a climate in which people want to perform. Expecting the followers to perform would not be possible unless the leader himself successfully demonstrate how to accomplish a particular task. Teaching skill, therefore, is also an important component of human skills. Similarly, to win the confidence and loyalty of followers, leaders must also have the requisite social skills. Social skills require a leader to understand the followers and be helpful, empathetic and friendly with them.

#### Conceptual Skill

This skill requires sensing the organization from overall perspective. A leader must have the ability to look at the organization as a whole. He should be able to relate various functions of the organization to how changes affect functions. Understanding of the organization, its financial status and its competitors and understanding of the functional nitty-gritty and their interrelationships are the essential requirements of conceptual skills.

#### Technical Skill

Technical skill involves specialized knowledge, analytical skill and competence (competence is the aggregation of skill, knowledge and abilities) for doing a job. These apart, principles, procedures and operations of a job also add to technical skills. Therefore, expecting followers to do the job, without the technical skills of leaders would not be possible.

#### Personal Skill

To get the best from followers, a leader also should have the personal skills like, intelligence, emotional maturity, personal motivation, integrity and flexibility of mind.

### LEADERSHIP THEORIES

To discuss about leadership theories, we have first given a cursory view and then grouped those in four major categories.

Kurt Lewin and Rensis Likert and Hawthorne Studies, have laid importance on the participative styles of leadership, which lead to the increased job satisfaction and higher performance.

#### Contingency Theories

Contingency theories basically argue that the 'right' or an effective leadership style varies according to the context. For instance, Blake and Mouton's Managerial Grid, has been very influential in the developmental practices of the organization.

#### Instrumental Theories

Instrumental theories on leadership put stress on task and person-oriented behaviour (e.g., participation, delegation) by the leader to gain effective performance from others.

#### Inspirational Theories

Inspirational theories, on the other hand, include charismatic leaders and transformational leadership. The leader of this category appeals to values and vision and enthruses others for raising their confidence and motivating them for change. This leadership comes from their compelling vision that draws in commitment and acceptance of change and offers a potential for anyone to grow and develop with the vision. Words used are trust, loyalty, devotion, commitment, inspiration, admiration, outstanding and exceptional. A recent overview comes from Robert House and Boas Shamir, who see it as the ability of a person to get an intense moral commitment and a strong identification from subordinates. They list a number of behaviours like articulating the vision, passion, self-sacrifice, risk taking, symbolic behaviours, etc.

#### Informal Leadership

Informal leadership looks at behaviours associated with those who are not appointed to authority but assume leadership in other ways.

## Path-Goal Theory

Path-goal theory looks at what leaders must do to motivate people to perform well and to get satisfaction from work. It draws on the expectancy theory of motivation and it has four leadership styles: supportive, directive, participative and achievement-oriented.

## CONTRIBUTORS TO THE LEADERSHIP THEORIES

**F. Fielder** was one of the pioneers of the contingency school, who offered his views ranging from task-focused to people-focused leadership. He argued that the most effective style depended on the quality of relationships, relative power position between the leader and the led and the nature of the task. He also argued that the style adopted was relatively stable and a feature of a leader's personality and, could, therefore be predicted. He distinguished between task-oriented and relations-oriented leaders.

**Hersey and Blanchard's** situational leadership dimensions are linked to task and relational behaviour. Task behaviour focuses on defining roles and responsibilities, whereas, relational behaviour is more about providing support to teams. The extent to which either is used depends on the person's job maturity and psychological security. Their test looks at elements around delegation, participation, selling or telling.

*Good leaders are made not born.* With one's desire and will power, one can become an effective leader. Good leaders develop themselves through a continuous process of self-study, education, training and experience.

Leadership influences others to accomplish a mission, task or objective and directs the organization in a way that makes it more effective. A leader carries out this by applying leadership attributes (belief, values, ethics, character, knowledge and skills). *Authority to accomplish certain tasks and objectives in the organization does not make one a leader. By virtue of power, it simply makes one the boss.* Leadership makes people achieve goals and objectives, while, on the other hand, bosses tell people to accomplish a task or objective.

According to **B.M. Bass**, there are three basic ways to explain how people become leaders. These theories are:

1. Some personality traits which may lead people naturally into leadership roles. This is the *Trait Theory*.
2. A crisis or important event may cause a person to rise to the occasion which brings out extraordinary leadership qualities in an ordinary person. This is the *Great Events Theory*.
3. People can choose to become leaders. People can learn leadership skills. This is the *Transformational Leadership Theory*. It is the most widely accepted theory today.

The basis of good leadership is the honourable character of the leader and his selfless service to organization. In employees' eyes, leadership is everything that does that affects the organization's objectives and their well-being. A respectable leader concentrates on what he/she is [be] (beliefs and character), what he/she knows (job, tasks and human nature) and what he/she does (implementation, motivation, providing direction).

What makes a person want to follow a leader? People want to be guided by those they respect and who have a clear sense of direction. To gain respect, leaders must be ethical. A sense of direction is achieved by conveying a strong vision of the future.

## FAMOUS STUDIES ON LEADERSHIP

Widely acclaimed studies on leadership can be listed as follows:

### Iowa Leadership Studies (1939)

Ronald Lippitt and Ralph K. White, under the supervision of Kurt Lewin, conducted this study at the University of Iowa, forming hobby clubs for ten-year old boys. Each club was put under three different styles of leadership, i.e. authoritarian, democratic and laissez-fair. The *authoritarian leader* was very directive and did not allow any participation. The *democratic leader* encouraged discussion and participation and the *laissez-faire leader* gave complete freedom. Under such experimental conditions, satisfaction, frustration and aggression of the boys were studied giving them the task of making masks, model airplanes, murals and soap carvings. Results of the study showed that boys under democratic leadership performed well than those who were under authoritarian and laissez-fair leadership. However, the study was considered incompatible to formal organizational environment obviously for pre-adolescent boys (sample) and for not adequately controlling the variables. Even then the study is considered as the pioneer as this was the first attempt to determine the effects of leadership styles experimentally on a group.

### Ohio State Leadership Studies (1945)

Business Research Group of Ohio State University, with an interdisciplinary team (psychologists, sociologists and economists) of researchers, analysed leadership influence on different groups and researchers using a structured Leader Behaviour Description Questionnaire (LBDQ). Consideration and initiating structure of leadership were found to be widely accepted by different heterogeneous groups like Air Force Commanders to School Superintendents.

### Michigan Studies on Leadership Styles (1961)

In this study, Rensis Likert and his group identified two major styles of leadership—employee participation and production orientation. The employee-centred style resulted to high performance compared to the production-centred style.

Directive, authoritarian or autocratic style of leadership is based on the assumption that the leader's power is derived from the status position he occupies, and men (subordinates) are inherently lazy and unreliable. Democratic or non-directive style of leadership is more concerned with human relationship, and it considers that men can be basically self-directed and can be made creative at work if properly motivated.

In between, there two extremes, there are, of course a wide variety of leadership styles. This will be clear from the following illustration:

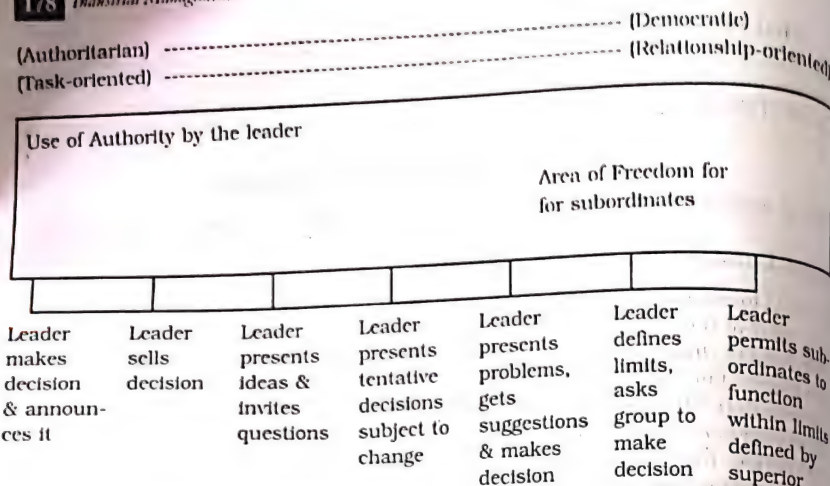


Figure 6.1: Variety of Leadership Styles

The third leadership style, i.e., laissez-fair style permits the members of the group to do whatever they want to do. No policies or procedures are established, and everyone is let alone. No one attempts to influence anyone else. Practically, this style develops no leadership at all in the group.

### Managerial Grid (1978)

Robert R. Blake and Jane S. Mouton have integrated the authoritarian and democratic concepts and developed a new concept 'Managerial Grid.' They recognized that leadership style is neither authoritarian nor democratic but is an admixture of the two philosophies and mixing them would vary in nature according to the variation in the situation.

In the Managerial Grid, five different types of leadership based on the concern for production (task) and the concern for people (relationships) are located in the four quadrants as shown in Figure 6.2.

1-9 (Country Club)	9-9 (Team)
5 (Middle)	5 (Road)
1-1 (Impoverished)	9-1 (Task)

123456789

(Low)(High)

Figure 6.2: Managerial Grid

Here, the concern for production is represented in horizontal axis. Production becomes more important to the leader as his rating advances on this horizontal scale. A leader with a rating of 9 on the horizontal axis has the maximum concern for production.

The concern for people is illustrated on the vertical axis. People become more important to this leader as his rating of 9 on this vertical axis has the maximum concern for people.

The five leadership styles are described as follows:

#### Impoverished (Low-Low, 1,1)

Leader exerts a minimum effort, avoids controversy and confrontation and takes the position of an observer to just meet the situation.

#### Country Club (Low-High, 1,9)

Leader expects the highest attention to the needs of people for satisfying relationship, which leads to comfortable and friendly organizational atmosphere and also work atmosphere.

#### Task-oriented (High-Low, 9,1)

This is the authoritarian, task-oriented, low human relation model. Efficiency in operations results from arranging conditions of work in such a way that there is the least interference of human elements.

#### Middle on the road (Middle, 5,5)

This type of leader compromises between the high production and employee satisfaction at the optimum level for an effective performance by the group.

#### Team (High-High, 9,9)

This is the style of a team leader. This leader is extremely concerned about the task, as well as, people. His concerns are about the accomplishment of work from committed people and the interdependence between him and his subordinates through a 'common stake' in organization. He also strives for a relationship of trust and respect.

Theoretically, there are eighty-one possible positions on the grid and each such position reflects one leadership style. However, the analysis of the grid focuses mainly on five basic styles listed above.

Grid approach is widely accepted in organizations as it helps managers to identify their individual leadership styles based on which they get to develop a framework for the ideal leaders and also the suitable training programmes. However, this study lacks empirical evidence. Hardly a few organizations can put this into use effectively due to the wide differences in the prevailing culture and practices.

An important extension of managerial grid approach is Reddin's *Three Dimensional Grid*, which is also known as 3-D Management. Three dimensional axes represent task orientation, relationship orientation and effectiveness. Adding effectiveness to the task orientation and relationship orientation, Reddin had actually tried to integrate leadership styles with the situational variables. Task orientation (TO) is defined as the leader's direction to his followers to achieve goals.

It is concerned with planning, organizing and controlling. Relationship orientation (RO) is defined as the extent of personal relationships of leaders with followers. It is achieved through mutual trust and respect to followers' ideas. If the style of a leader is appropriate to a given situation, we call it effective and vice versa. Effectiveness and ineffectiveness are measured in terms of the appropriateness of a particular kind of behaviour in a given situation. On the basis of this model, we can explain four styles of leadership as below:

RO	Related	Integrated
	Separated	Dedicated
TO		

These four styles represent four basic types of behaviour. A *separated leader* is concerned with correcting deviations. A *related leader* accepts others, is not bothered about time, looks to the organization as a social system, loves to work with others and receives cooperation from others (followers) by setting examples. *Dedicated leader* dominates and is interested only in production. He never identifies himself with his subordinates. He only works with power. The *integrated leader* gets himself and his followers involved with the organization. He emphasizes on the team work. Any of these styles may be effective in one situation but not in another. We can illustrate these styles categorizing it in two types, i.e., 'less effective style' and 'more effective style'.

Basic Style	Less Effective Style	More Effective Style
Integrated	Compromiser	Executive
Dedicated	Autocrat	Benevolent Autocrat
Related	Missionary	Developer
Separated	Deserter	Bureaucrat

### Continuum of Leadership Behaviour

Tannenbaum and Schmidt (1973) have explained the range of possible leadership styles on a continuum from authoritarian to free rein.

Boss-centred Leadership ← ----- Subordinate-centred Leadership

Use of authority  
by the manager

Figure 6.3: Possible Leadership Styles on a Continuum

The above figure illustrates the number of leadership behaviour. On the left side of the continuum, leaders enjoy a high degree of control and believe in less delegation of authority. On the extreme right side, leaders give their followers freedom and show their initiative in work-related matters. A leader moves along the continuum based on three forces, i.e., forces of the leader himself, forces of the followers and forces in the situation.

#### Forces in the Leader

These forces are influenced by the value system of the leader, his confidence in his followers, his inclinations and finally his level of tolerances.

#### Forces in the Followers

These forces are influenced by the followers' need for tolerance for ambiguity, their readiness to assume responsibility for decision making, interest in understanding problems, the level of understanding organizational goals and finally their experience with and expectations from leaders.

#### Forces in the Situation

These forces include the type of organization, its problems, group effectiveness and the time pressure.

*Continuum Theory* provides a wide range of leadership behaviour, and its success depends on the behavioural modifications of leader as per the needs of the situation. However, the basic difficulty in the theory lies in the fact that it supports unidimensional thinking. An increase or decrease of any particular type of behaviour may decrease or increase the other type of behaviour. Another important aspect of this theory, which has been focused by the researchers, is that employee orientation and task orientation are not opposite ends on a continuum. It means a leader, if becomes more employee oriented, he does not necessarily become less task oriented. This was also corroborated by Ohio Studies.

### Four Framework Model

In the *Four Framework Approach*, Lee Bolman and Terrence Deal (1991) suggested that leaders display leadership behaviours in one of four types of frameworks: Structural, Human Resource, Political or Symbolic. The style can either be effective or ineffective, depending upon the chosen behaviour in certain situations.

#### Structural Framework

In an effective leadership situation, the leader is a social architect whose leadership style is analytic and well designed. In an ineffective leadership situation, the leader goes into the details and reflects the behaviour of a typical bureaucrat. Structural leaders lay emphasis on structure, strategy, environment, implementation, experimentation and adaptation.

#### Human Resource Framework

A leader with HR framework acts as a catalyst. He supports, advocates and empowers his followers. He believes in people and also communicates the message

accordingly. By sharing information, he enhances the participation of his followers and involves them in decision making. Contrarily, a leader with less HR framework acts as a pushover, he abdicates, and he is even called a hoax.

### Political Framework

An effective leader with this framework is an advocate; his leadership style is coalition and team building. An ineffective leadership, on the other hand, is a hustler; his style is manipulation. Political leaders clarify what they want and what they can get; they assess the distribution of power and interests; they build linkages to other stakeholders; they use persuasion first and then use negotiation and coercion only if necessary.

### Symbolic Framework

In an effective leadership situation, the leader is a prophet, whose leadership style is inspiration. In an ineffective leadership situation, the leader is a fanatic or fool, whose leadership style is smoke and mirrors. Symbolic leaders view organizations as a stage or theater to play certain roles and give impressions; these leaders use symbols to capture attention; they try to frame experience by providing plausible interpretations of experiences; they discover and communicate a vision.

This model suggests that leaders can be put into one of these four categories, and there are times when one approach is appropriate and times when it would not be. Any one of these approaches alone is inadequate. We should be conscious of all four approaches and not just rely on one. To take an example, during a major organizational change, a structural leadership style may be more effective than a visionary leadership style, while, during a period when strong growth is needed, the visionary approach may be better. We also need to understand ourselves as each of us tends to have a preferred approach. We need to be conscious of our preferred approach at all times and be aware of its limitations.

## MISCELLANEOUS THEORIES OF LEADERSHIP

F.W. Taylor's Scientific Manager's Style (1911), Contingency Theory of Leadership by F.E. Fielder (1967), Group and Exchange Theories of Leadership by Hollander and Julian (1969), Path-Goal Theory by R.K. House (1971), Trait Theory of J. Kelly (1974), Social Learning Theories by A. Bandura (1977) and Situational Leadership Approach by Kenneth Blanchard, Patricia Zigarmi and Dera Zigarmi (1990) also explain leadership theories but among all these Situational Approach is more preferred for its relevance to real-life work situation and more particularly for its applicability in service sector also.

From the above theoretical discussions, we can group various leadership theories in to following four categories:

1. Trait Theory of leadership
2. Behavioural Theory of leadership
3. Situational Theory of leadership
4. Great Man Theory of leadership

## Trait Theory of Leadership

Trait Theory seeks to determine personal characteristics of effective leaders. It points out that the personal traits or personal characteristics of a person make him an effective or successful leader. Charles Bird examined twenty lists of traits attributed to leaders in various surveys and found that none of the traits appeared on all lists. Leaders are characterized by a wide variety of traits ranging all the way from neatness to nobility. Leaders are presumed to display better judgment and engage themselves in social activities. The study of the lives of successful leaders reveals that they possessed many of these traits. According to the Trait Theory, the persons who possess the following traits or personal characteristics could become successful leaders:

**Good Personality:** Physical characteristics and level of maturity determine the personality of an individual. Success of a leader, to a great extent, depends on the good personality.

**Intellectual Ability:** For a leader, the level of intelligence should be higher than his followers. Intellectual ability enables a leader to analyse the situation accurately and take decision accordingly.

**Initiative:** A leader should have the initiative to undertake activities on time.

**Imagination:** It is also an essential trait for a successful leader. He must be able to visualize trends and adopt the right course of action to achieve the result.

**Maturity:** A leader should have emotional maturity and balanced temperament. Maturity is reflected through behavioural tolerance.

**Desire to Accept Responsibility:** Accepting responsibility for his actions (irrespective of the results) creates a positive impression in the minds of the followers. A leader should have this trait also.

**Self-confidence:** A leader should be self-confident. His self-confidence motivates his followers and boosts their morale.

**Flexibility and Adaptability:** To become flexible and adaptable, a leader should have an open mind to accept others view points. This fosters innovation and creativity in an organization.

**Objectivity and Fairness:** In dealing with followers, a leader should be objective and fair. This trait requires a leader to be honest, fair, impartial, unbiased and of integrity.

**Considerate:** To be considerate to the followers ensures cooperation from the followers, which adds to the success of a leader.

### Limitations of Trait Theory

1. One of the major limitations of this theory is that it assumes leadership to be a born quality. This is not always correct. Leadership quality can also be developed through training. Even by successful handling of a crisis situation, one can emerge as a leader. This has happened in case of Russey Mody on 1 May 1947 at Jamshedpur plant of Tata Iron and Steel Company, where he could pacify the militant workmen, who were beating executives and supervisors to outburst their grievances.

2. A particular trait or some traits may help a leader to successfully manage a situation but he may fail in other situations. It is also difficult to find a leader with all such listed traits.
3. There is no quantitative tool to measure a trait or traits. Absence or presence of traits could only be understood only when a situation occurs and a leader manages the situation.
4. List of personal traits are only indicative and not exhaustive. A successful leader may have other traits like: foresight, vision, methodical, thorough, etc., also.
5. Personal traits are only a micro part of leadership. In order to be a successful leader, one must have other qualities also. Hence, measuring leadership quality only on personal traits may be wrong.

### Behavioural Theory of Leadership

As per this theory, a particular behaviour of a leader provides a greater satisfaction to the followers. Such behavioural attribute enables followers to recognize a leader. This theory is based on the premise that a leader plays a role behaviour, using his conceptual, human and technical skills, which influence the behaviour of followers. Behaviour is not a trait; it sets a particular role pattern. For instance, a leader may have a nurturing parent behaviour, which appreciates the problems of followers and even cajoles them when they fail to deliver, whereas, there are also leaders who may have a critical parent behaviour, which depicts critical nature in dealing with such situation. He never appreciates, only reprimands.

#### Limitations of Behavioural Theory

1. The behavioural theory cannot justify why a particular leadership behaviour is effective in one case and fail in another case. To take an example, nurturing parent behaviour may be effective to stop the recurrence of failure on the part of subordinates in one case, whereas, it may not work in another case, where followers may take advantage of this behaviour on the part of the leader and repeat the same mistake. Critical parent behaviour could have been better in the second situation.
2. This theory does not recognize the traits of leaders. Certain traits, however, may make a successful leader.

### Situational Theory of Leadership

This theory attributes leadership emerges from a situation, i.e., how in a given situation a leader performs. Followers tend to follow a leader who is capable to fulfil their aspirations in a given situation. A leader, duly recognizing the need of the situation, performs. Hence, his style may differ from situation to situation. Again, we can cite the example of Russy Mody, who had emerged as a leader because of his proactive way of dealing with militant workmen.

#### Limitations of Situation Theory

1. Major limitation of this theory is that it lays emphasis on the leadership of a leader in a given situation. If the situation changes, there is no mention whether a person still continue to be a leader. The best example here is

- trade union leaders. Followers may reject the leadership, if a trade union leader fails to meet their expectations in different situations.
2. Since situation changes, same style in all situations may not guarantee success. However, the style of leadership is influenced by particular traits and the behavioural role of a leader.

### Great Man Theory of Leadership

This theory emphasizes that leaders are born and not made. Hence, great leaders are natural leaders. It is partly true that some leadership qualities cannot be acquired even through training, for example, commanding personality, charm, courage, intelligence, persuasiveness and aggressiveness. This theory, therefore, emphasizes that leadership qualities are inborn, hence ordinarily people cannot become leaders.

#### Limitations

1. This theory is not scientific and also has no empirical basis. In many cases, one can prove this theory wrong.
2. This theory neither explain who are leaders and how they emerge as leader, nor how they behave and emerge as achievers.

### LANGUAGE OF LEADERS

The six most important words: 'I admit I made a mistake.'

The five most important words: 'You did a good job.'

The four most important words: 'What is your opinion?'

The three most important words: 'If you please.'

The two most important words: 'Thank you.'

The one most important word: 'We'

The least most important word: 'I'

### SUMMARY

In this chapter, we have discussed various concepts of leadership, drawing lessons from organizational practices across the globe. Leaders must perform situation analysis to decide the corrective action and to move from one action to another. He/she must be able to make timely decisions, be competent enough to use problem-solving techniques, decision-making tools to churn the situation desirable for the organization. However, one important thing is to remember that no particular style may prove to be all-purposive in any situation. Situational changes determine the leadership style. Today throughout the world, leadership is considered as one of the important training needs for organizations to gain competitive advantage. Hence, it is no less important. Building leadership, therefore, now considered as the important priority for organization. It requires a systematic understanding of the existing skills and proficiency of the employees and train them suitably through a systematic approach.

## REVIEW QUESTIONS

1. Briefly state the history of leadership. Why is leadership so important in today's organization?
2. Is leadership different from management? Explain.
3. What are the important characteristics of leadership?
4. State the significance and principles of leadership.
5. How does environment affect leadership styles? Do culture and climate of an organization also affect leadership in an organization?
6. Describe the important factors of leadership.
7. List out the functions of a leader. What is the principle objective of a leader in an organization?
8. Is leadership an exertion of power? Explain the relationship between leadership and power.
9. Discuss different leadership styles. How do leadership styles differ from organization to organization and also in the same organization?
10. What are the important attitudinal elements of effective leadership?
11. Explain the important skills of leadership. Do you think the degree of such skill sets is uniform in every situation?
12. Briefly explain the theories of leadership.
13. *Leaders are born and not made!* Do you agree with this statement? Justify your answer.
14. Discuss the theory of Managerial Grid. How it is different from 3-D Leadership Model?
15. What is continuum leadership behaviour?
16. Explain the leadership framework. Is it necessary for all leaders to follow a particular framework of leadership in every situation?
17. What is Trait Theory of leadership? How is it different from the Behavioural Theory?
18. Explain the relationship between Situational Theory and Great Man Theory of leadership.
19. What is formal and informal leadership? Does informal leader follow any particular style of leadership?
20. Short Notes:
  - (a) Leaders and Followers
  - (b) Communication and Leadership
  - (c) Laissez-faire Style of Leadership
  - (d) Transformational Leader
  - (e) Paternalistic Leader
  - (f) Leadership and Empathy

## REFERENCES

1. Avery, G., and E. Baker. 1990. *Psychology at Work*. New York: Prentice-Hall.
2. Bennis, Warren, and Bert Nanus. 1997. *Leaders: Strategies for Taking Charge*. New York: Harper Business.
3. Bernard, M. Bass. 1990. *Bass and Stogdill's Hand Book of Leadership*, New York: Free Press.

4. Bolman, Lee G., and Terrence Deal. 1991. *Reframing Organization, Artistry, Choice and Leadership*. San Francisco: Jossey Press.
5. Bhattacharyya, D.K. 2009. *Organizational Behaviour*. New Delhi: Oxford University Press.
6. French, W.L. 1990. *Human Resource Management*, 4th edition. Boston: Houghton Mifflin.
7. Koontz, Harold, Cyril O'Donnell, and Heinz Weihrich. 1993. *Essentials of Management*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
8. Kotter, John P. 1996. *Leading Change*. Boston: Harvard Business School Press.
9. Likert, R. 1961. *New Patterns of Management*. New York: McGraw Hill.
10. Lynne Joy, Larry E. Senn, and John, R. Childress. 1994. *21st Century Leadership: Dialogues with 100 Top Leaders*. New York: The Leadership Press.
11. Paul, Hersey, Kenneth H. Blanchard, and Dewey E. Johnson. 2001. *Management of Organizational Behavior - Leading Human Resources*, 8th edition. New Delhi: Pearson Education.
12. Selznick, P. 1957. *Leadership and Administration*. New York: Harper and Row.
13. Stephen, P. Robbins. 2005. *Organizational Behavior*, 11th edition. New Delhi: Prentice-Hall of India.
14. Tannenbaum, Robert, Irving B. Weschler, and Fred Massanick. 1979. *Leadership and Organization*. New York: McGraw Hill.
15. Terry, G. 1960. *The Principles of Management*. Homewood, Illinois: Richard Irwin Inc.
16. Vecchio, Rober, P. 1988. *Organizational Behaviour*. Chicago: Dryden Press.

# Organizational Control

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend definitions and concept of control
- know the essentials of good control
- understand the interdependence of control with other functions of management
- be familiar with various steps involved in controlling function
- comprehend the methods of control
- realize the importance of control
- understand various tools and techniques of control

## INTRODUCTION

Planning, organizing and directing set the pace, while control ensures that results are achieved in line with the goals and objectives decided by the management. Like planning, controlling is also a never-ending process of management. Management through periodic intervention forces the activities of an organization to conform to plans. Therefore, planning and controlling are intimately related. Like planning, controlling also has the same characteristics of unity, continuity, flexibility and pervasiveness. By comparing actual results with the plans, management enforces control to accomplish the goals. Even through control process, management can understand the possible difficulties in achieving the results as per plan and thereby can go for the periodic review of the plans to keep pace with the changing requirement. Like planning, controlling is also a managerial function, which cannot be delegated. Now-a-days, we can make the planning process participative, in order to increase the commitment of the down-the-level employees. However, controlling can never be delegated. Management through periodic review suggests remedial action, alteration of plans, change in the structure of organization in the staffing process or even change in the process and style of direction. All these form the part of the control process. In fact, control completes the complete sequence of managerial process. Some authors

distinguish the terms 'control' and 'controlling'. While control involves keeping the organizational activities and functions on the right track, duly aligning it with plans, controlling is defined as the process of control. Process of control means how managers enforce control by developing performance standards, comparing ongoing performance and taking corrective steps. Here, however, we have not considered such finer distinction and both the terms *control* and *controlling* have been used interchangeably.

## DEFINITIONS OF CONTROL

Merry Parker Follet defined control as '....an aspect of projection of planning.' She further continues, 'Whereas planning sets the course, control observes deviations from the course and initiates action to return to the chosen course or to an appropriately changed one.'

According to Beilley Goetz, 'Managerial planning seeks consistent, integrated and articulated programmes, while management control seeks to compel events to conform to planning.'

Henri Fayol defined control as 'In an undertaking, control consists in verifying whether everything occurs in conformity with the plans adopted, instructions issued and the principles established. It has for object to point out weakness and errors in order to rectify them and prevent recurrence. It operates on everything, things, people and action.'

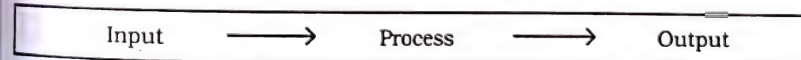
As per W. Haynes, 'control means the management or accomplishment of events against the standard of plans and the correction of deviations to ensure the attainment of objectives according to plans. It consists of knowing the extent to which actions are in accordance with the plans and issued instructions, to report and analyse errors and deviations and to initiate adequate corrective actions'.

According to P. Strong, controlling:

- measures the results against objectives, plans, programmes and standards
- decides if any deviations is significant
- takes action designed to prevent unfavourable deviations
- answers the continuance of above standard results

## What Is Controlling?

Reviewing the definitions, in the broadest term, we can define control as the efforts of the people that are controlled. Efforts of the people can be broken down into three areas:



Incorporating the essential ingredients of above definitions, we can also give a comprehensive definition of control as below:

As function of management control indicates measuring and correcting the subordinates' performance of activities so as to ensure that the organizational plans and objectives are achieved. Control is also to know the extent to which actions are in accordance with the plans and issued instructions, to report and analyse errors and deviations and to initiate adequate corrective actions.

## CHARACTERISTICS OF CONTROL

On the basis of definitions of control, following characteristics can be formulated:

### Control and Planning Are Closely Related

In fact, the terms 'planning' and 'control' are used interchangeably in the designation of departments which carry out production planning, scheduling and routing. It emphasizes that there is a plan which directs the behaviour and activities in the organization. Control measures these behaviour and activities and suggests measures to remove deviations, if any.

Thus, control implies the existence of certain goals and standards. These goals and standards are provided by the planning process. Control is the result of particular plans, goals and policies. It is forward looking since one can control future happenings and not the past. However, on the control process, always the past performance is measured because no one can measure the outcome of a happening, which has not occurred. In the light of these measurements, managers suggest corrective actions for the future period.

### Control Is both an Executive Process and from the Point of View of the Organizations of the System, a Result

As an executive process, each manager has to perform control function in the organization. According to the level of manager in the organization, the nature, scope and limit of his control function may be different as compared to a manager at the other level. Administrative control constitutes the most comprehensive control concept. All other types of control may be subsumed under it.

### Control Is a Continuous Process

Though managerial control enables the manager to exercise control at the point of action, it follows a definite pattern and time table, month after month and year after year on a continuous basis.

- Control is a coordinated and integrated system
- This emphasizes that although data are collected for one purpose, these data should be reconciled with one another. In a sense, control system is a single system, but it is more accurate to think of it as a set of integrated sub-systems
- Control is neither the beginning nor the end function of any management process, it is in-process
- Control is a dynamic process
- Control is exercised at all levels of management
- It is identified with individuals
- It does not necessarily mean curtailment of the rights of the subordinate managers and individuals
- Control is not something as interference as Follet had pointed out long ago. In fact, control implies: (a) control by facts rather than control by means (b) correlation of many controls in place of superimposed control

## ESSENTIALS OF GOOD CONTROL

- Control must reflect the nature and needs of the activity
  - Control should be so designed that an activity, its implementation procedures and its very purpose become apparent. The control system should be adequate enough to understand the need of the activity, its implementation and its achievement
  - Control should report deviations promptly
  - The effective control system detects deviations before they actually occur.
  - Manager should be provided with information as soon as possible so that he can prevent failures
  - Control should be objective. Therefore, the performance evaluation of subordinates should not be subjective; rather, it should be definite and objective. Subordinates' respond favourably to the objective and impartial evaluation of their performance
  - Control should be motivating, it should not be coercive
  - Control system should motivate both controller and controlled. The design of control system should be such that aims at motivating people by fulfilling their needs
  - There should be some managerial self-control
- Other essentials for good control are as follows:

### Forward-Looking Control

Ideal control is instantaneous, self-correcting and forward-looking. Managerial control is not exactly similar to the mechanical or electronic control. Normally, there exists a time-lag between recording and reporting the deviations and the corrective actions to become operative. A manager should, therefore, structure his control system in a way so that deviations are predicted well in time, and corrective actions can be initiated before substantial deviations occur.

### Flexible Control

In order to accomplish objectives, if it becomes necessary to revise the plans, the control system must have the scope to adopt itself to new developments. The core idea is to make control process workable in dynamic business situations. Flexible plans tend to make the control adaptable to new situations.

### Organizational Suitability

Organizational suitability control is enforced through managers, whose role positions are embedded in the organizational pattern itself. Managers are provided with required authority, so as to enable them to exercise self-control and to initiate corrective actions. Control information flow should be in consistent with the prevailing organizational structure.

### Control Should be Economical

Control system should be economical. Economical control system is cost effective. A cumbersome control system may sometimes have to be discarded because cost and benefit considerations do not warrant its installation.

A small company cannot always afford technology-empowered control systems like large companies.

### Strategic Point Control (Pointing Out Exceptions at Critical Points)

All deviations are not of equal importance and do not require the same amount of attention. It is thus one of the essential requirements of an effective control system to highlight the critical or limiting points that deserve close management attention for appraisal and adjustments. Thus, efficient control system discriminates between important and unimportant factors and through it, makes the system more effective and less costly.

### Control Should be Simple to Understand

Often control system experts recommend more sophisticated techniques of control systems overlooking their understandability to the managers of the organization. Also a cumbersome control system may not motivate people to use it, resulting dependence on the traditional informal control, based on grapevine information. Thus, while launching a system of control, the management should see such tool is properly understood by all those who have to manage it. Mathematical formulae, complex break-even charts and detailed statistical summaries, though very useful may fail to prove as effective control devices if their meaning is not properly communicated to the executives who have to use them.

### Control Suggests Corrective Action

Effective control system should be capable to track deviations on time and suggest the required corrective actions. Simple tracking of deviations is not just enough. It should also be able to prevent deviations and errors, so that it does not occur.

### Worker-Focused Control

Modern control system is worker focused rather than work or job oriented. If any corrective action is called for, persons accountable for results are to be located for initiating remedial actions. Worker-focused control is generally associated with higher productivity.

### Feedback

A manager responsible for control needs a continuous flow of information relating to the actual performance so that deviations are promptly corrected in time. Information which flows back to the manager for this purpose is nothing but feedback. Feedforward information flows back from the manager to the performers. Information may be given as a feedback informally or formally. Informal feedback is through personal contact, informal discussion and personal observation. Financial statements, reports, statistical analysis and other written communications furnish examples of formal feedback. In every organization, information is given as a feedback both formally, as well as, informally.

## Interdependence of Control with Other Functions of Management

Since control implies the existence of goals and plans, no manager can exercise control without them. He cannot measure whether his subordinates are operating in the desired way unless he has a plan. Without organization, it cannot be ascertained that who should make evaluations and who should take corrective actions. In absence of an effective direction, a manager cannot signify the impact of corrective action on the actual performance. Thus different phases of management process need to be effectively linked together. All these functions of management greatly facilitate the control process.

### PREREQUISITES OF A GOOD CONTROL SYSTEM

Two prerequisites must exist before any manager can devise or maintain a system of control.

#### Control Requires Plan

It is obvious that before a control technique can be used, the control must be based upon clear and integrated plans. Control is the reverse side of the coin of planning. Plans are required first as management plans, then plans become standards by which desired actions are measured. Hence, plan becomes the foremost requirement of control.

#### Control Requires Organizational Structure

Goals or objectives and strategies of the organization, require each and every people to share responsibilities and to contribute to its accomplishment. Responsibility accounting can be imposed at all levels of management, and the points of deviations can be very easily located. Hence, the control vouches for the necessity of a suitable organization structure.

### THREE TYPES OF CONTROL

In accordance with the stages of application, control function is divided into three types.

#### Preliminary Control

It is exerted through the process of planning and allocation of resources in the operation. It means that allocated human resources should be able to meet the job requirements. Allocated material resources should be in accordance with the quality and standards available on time. Machines and equipment must be available on time, and so also the optimum availability of financial resources.

#### Monitoring

It is a concurrent or simultaneous control system to monitor the ongoing operations, so as to ensure the achievement of intended objectives of an organization. Traditionally, organizations enforce such control through managers and supervisors, who ensure this through on-the-spot verification of the activities, based on the *standard operating procedures (SOP)* or any other defined guidelines and policies of the organization.

### Evaluative or Feedback Control

It considers the end results to develop the framework for future actions. Some of the commonly used techniques used for this type of control are, impact analysis, quality control, performance evaluation and cost-benefit analysis.

The distinction between these three control stages or types, helps us to broadly classify the stage-wise scope of control functions and accordingly select the matching control techniques.

From another perspective, we can define control types as (i) Strategic Control, (ii) Tactical Control (iii) Operational Control Systems.

### Strategic Control

A strategy is selected and implemented over time. However, strategies being forward looking, designed to accomplish the objectives in future, it is necessary to enforce control over strategy. We have discussed this in details in our chapter on Planning.

### Tactical Control

Tactical control focuses on assessing the implementation of tactical plans at departmental levels, monitoring results and taking corrective actions, if necessary. Middle-level managers make use of this control for achieving departmental goals and objectives, meeting departmental programmes and budgets.

### Operational Control Systems

Operating managers also need control methods appropriate to their level of strategy implementation. Their primary concern is allocation and use of the company resources. An operational control system is enforced in the form of guidance for the monitoring and evaluation of operational activities of the organization. This helps in accomplishing the organizational objectives.

### Managing without Control

CHEVRON Corporation, a leader in the petroleum industry, practices 'direct participation', as an efficient process of designing and also for implementing change. This has helped the company to develop a response capability for the workforce (using their 'collective wisdom') to out manoeuvre competitors. The system works like this:

- Organize large-scale conferences (of two to three days) involving variety of stakeholders
- Discuss on issues that require change
- Bring multiple perspectives for action
- Select the line of action
- Communicate the same throughout the organization
- Implement the identified changes

Getting excited by their results, one of the large automobile manufacturers in India, which employs mostly engineers even in their shop floors, emulated their practices. This organization, being professional and employees being highly educated followed a matrix structure, creating a number of positions for project heads, who had been given the task of managing independently after finalization and implementation of the participative plans. The system started with much enthusiasm hoping that results would be better in a sluggish competitive market. However, the annual review indicated that the company could only achieve to the extent of 70 per cent of their targets as per plans. There was no system of intermediate review by the top management. The company had to drop their new system and reverted back to their old hierarchical structure.

### STEPS IN CONTROL

To enforce control in organizations, we follow certain steps as below:

#### Establishment of Standards

The first step in the process of control is to *formulate plans and establish standards*.

Planning requires projection of the future, while standards relate to the criteria of performance. Since, plans are yardstick against which control must be desired, it follows logically that the first step in the control process would be to establish plans. Standards may be tangible or intangible, vague or specific. However, these must be so expressed that the people concerned can understand them and that the accomplishment of assigned duties can be measured against them. Standards relating to factors like employee morale, loyalty and results expected of a training programme and public relation cannot be generally stated in quantifiable terms. Such intangible and somewhat abstract standards need special care. To judge the performance, organizations may consider a large number of standards and the strategic control points and ultimately decide the most effective standards for appropriate assessment of performance. While determining strategic control standards, management should be economical, comprehensive and balanced.

Control standards would be effective when it relates to the specific performance of individual. This is due to the reason that in organizations, people are held responsible individually for the delivery of results. At times, however, this process of individual-based performance standards may not work. This is more particularly in a situation, where individual decisions are based on cross-functional inputs. It is now the practice in the organizations to form a Tender Purchase Committee (TPC), drawing people from different functions, so that correct purchase decisions (in the form of cost effectiveness, quality and on-time delivery) can be made. Let us consider the case of the level of inventory holding in any organization. This depends not absolutely on individual decisions, but on the decisions of several others, like those in production and marketing, etc. In these cases, performance standards can be set at each individual level of decision making to ensure better control.

## Measurement of Performance

The second basic step in control process is the evaluation of performance. At this stage, performance evaluation system is decided. Such evaluation system must be appropriate in measuring the work in terms of control standards and communicating the appraisal to persons responsible for taking corrective actions.

Measurement of performance must be in those units which are corresponding to units of standards. It is not a mere post-mortem of past events. It is not intended just to determine the mistakes. It enables the manager to predict future problems. Hence, it should ideally be forward looking to detect the deviations, before it occurs, so that unwanted situations can be avoided by taking suitable actions, well in advance.

Measurement of actual and expected performance would be easy when standards are properly developed, and the measurement criteria are expressed in physical and monetary terms. To take an example, units of production, volume of sales, rate of rejection, value and volume of production loss due to the machine downtime, etc., are some of the effective measurement criteria to evaluate the performance standards. However, qualitative or intangible performance cannot be so measured precisely, just the way we cannot measure the employee morale. Organizations in such cases make use of psychometric tests, attitudinal and opinion surveys, focused group interviews, etc. As these techniques are more intuitive in nature and may not exactly track or account for the exact performance standards, Peter Drucker believed that it is not always necessary to make the measurements criteria absolutely quantitative. Rather, it is more important both for the tangible and intangible performance to develop measurement criteria which can meet the following conditions:

- (a) Must be clear, simple and rational
- (b) Must be specific and relevant
- (c) Must provide direction to focus attention and efforts
- (d) Must be reliable and self-evaluative

To compare the actual and the standard performance, organizations can follow two steps, (i) assessment of the extent of deviations and (ii) identification of the causes of deviations. Since, the nature of deviations is often very specific to the type of activity, organizations cannot adopt any uniform practice to determine the deviations. To take an example, any minute variation in the balancing of a gun barrel (mainly ascertained by Viewers, who are trained to perform this task manually seeing through the gun barrel) can ultimately render the barrel unusable, as it is a very crucial quality parameter. On the other hand,  $\pm 5$  per cent deviations in the chemical properties of a steel bar may not render the same unusable.

## Correction of Deviations

This is the last stage in the control process. It requires *initiation of actions to ensure desired control*. In fact, correction of deviations is the point where control grows together with other functions of management, like, planning, organizing, staffing and directing. Due to this, many persons hold the view that correcting deviations is not a step in the control process. Correction may be done through redrafting the plans, changing the organizational structure, by re-staffing or through better direction of subordinates.

## METHODS FOR CONTROL

### Policies

To ensure the preliminary level of control, policies, which provide guidelines for routine decisions, are considered more effective. Setting up of policies and implementation of policies are different. Policy setting is included in the planning function of management, whereas, policy implementation is a part of the control function of management.

### Job Descriptions

Job descriptions are a part of the control function since they predetermine the activities, responsibilities and authority of the job-holder.

### Quality Control of Materials

The materials to be used in the production process must conform to the quality standards. Let us suppose, management takes decision on the acceptance of materials on  $\pm 5$  per cent deviations. To ensure the same, it may then enforce control over the quality of supplied materials through random sample checking, i.e., decisions on acceptance or rejection of supplied materials based on sample observations. This preliminary control system for acceptance or rejection of supplied materials is construed as policy guidelines to take routine decisions. Such policy guidelines or predetermined standards are easily understood by the concerned people who can automatically take decisions, without referring the same to their seniors. A sample of documented instructions to draw random samples from the supplied materials, detailing the methods of sample selection, can simplify the task of the quality control inspector.

### Budgets

Budgeting controls the availability and the interest costs of financial resources. A budget can facilitate the availability of funds to meet the financial obligations in anticipation of the flow of activities in a production or operation cycle. Thus, budget is an effective checklist for the managers. This ensures that all necessary items have been considered. To take an example, an organization may include recommended ratios or percentages for each and every item and restrict the manpower cost of a given project to a maximum of 30 per cent of total cost. In this case, it can be said that the budget for the manpower cost of the project is 30 per cent of the total cost.

### Audit

Periodic audit becomes the primary source of collecting information to evaluate the activities of a programme. Audits are of different types. Management audit focuses on efficiency of doing a project. A financial audit, on the other hand, evaluates the financial aspects of the project. This can be enforced by the manager through periodic summarizations and classification of financial statements, considering the four primary components of financial structure of any organization, i.e., income,

expenses, assets and liabilities. Also, a financial audit helps the managers to take stock of organizational financial planning and budgeting.

### Standard Cost Analysis

Information on standard cost system helps the manager to compare the actual costs with the standard costs and to understand the possible reasons for the variation, if any. Also, it helps in determining the appropriate corrective action, to avoid future variation (more in the form of upward change) in the costs, which otherwise could be detrimental to financial health of the organization.

### Employee Performance Evaluation

This is again another type of most significant and difficult feedback control techniques. For any organization, their ultimate source of competitive strength lies with its people. Hence, effective performance of people can make one organization better than the other. Employee performance evaluation is important for this reason. Again it is difficult to measure because objective performance standards are difficult to develop. One of the important methods of the performance evaluation is the *period performance appraisal of employees*. The scientific structuring of the performance appraisal form makes the task easier. The most effective way is to develop individual Key Performance Areas (KPAs) and Key Result Areas (KRAs) in qualitative and quantitative terms (which are targets given to employees) in line with the overall organizational objectives (Management by Objectives). This approach makes the task of employee performance evaluation little easier.

However, care should be taken to ensure that KPAs and KRAs are made or developed for the employees following a participative approach, i.e., developed upon mutual consensus. We must not, however, forget that this can only reduce the problem of evaluation and not eliminate the problem altogether. Another approach is by comparing with labour productivity ratios. Standard productivity ratios can be developed either internally or benchmarking or comparing with other organizations.

### Impact Assessment

Many organizations, through the analysis of the impact of their decisions, try to measure the implications of their plans and how far the planned objectives are met. Control is enforced through alteration of plans accordingly. To illustrate and to provide better customer services, a new generation private sector bank may decide to introduce online banking. However, online banking services may create problem due to the lack of adequacy of technological support at the customers' end. The bank may find it better to improve customer services through more ATMs and through the introduction of Credit Cards or Debit Cards. Hence, the impact assessment helps in effective control of customers' services.

### Graphic Charts and Diagrams

Network diagrams, graphs and charts help to plot the organizational activities. All these can help the employees to visualize the interrelationships between the activities and to determine the operation-wise time requirement. Control is enforced

when the time requirement exceeds or likely to exceed the standards displayed in the charts and diagrams.

From the above discussions, we can summarize different types of control, keeping in view the current organizational practices, as below:

- Controls used to standardize performance for increasing efficiency and reducing costs by way of time and motion studies, inspections, written procedures or work schedules
- Controls used to conserve company assets through allocation of responsibilities, separation of operational, custodial and accounting activities and adoption of proper authorization and record keeping
- Controls used to standardize quality by way of inspection, statistical quality control and product specifications
- Controls used for providing free limits to the use of delegated authority without further approval of the top management. Instruments for these controls include organizational and procedural manuals, policy directives and internal audits
- Controls used to measure the job performance by way of special reports, internal audits, budgets, standard costs and output per hour or per employee
- Controls used for planning future operations through sales and production forecasts, budgets, cost standards and other standards for the measurement
- Controls used to permit the top management for keeping various plans and programmes in balance through master budget, policy manual, organizational manual and the use of coordinating committees and management consultants
- Controls designed to motivate personnel through promotions, rewards for suggestions, profits sharing and other methods of recognizing achievements

### IMPORTANCE OF CONTROL

Importance of control can be enumerated by listing the following benefits of controlling:

#### Insurance Value of Control

The risk of nonconformity of the actual performance with intended goals is largely estimated by controlling. The basic function of control lies in regulating operations in such a way as to insure the achievement of predetermined objectives. Continuous review of work progress for making necessary adjustments in operations brings the performance back into line or holds it in line with the intended goals.

#### Basis for Future Action

Evaluation of final results on the completion of work makes facts and information available for future planning and organizing. Such evaluation helps in replanning for repetitive operations, in planning for the next step in nonrepetitive operations,

in introducing organizational changes, as well as, in rewarding, punishing or disciplining subordinates. As a matter of fact, a long-range planning becomes impossible unless control information flows continuously between work projects.

### Indication of Managerial Weakness

Control keeps a check on other functions for ensuring successful management. The problems of control stem mainly from deficiencies in other management functions. Before accomplishing the work, there may appear too many unknown and unforeseen situations which cannot be covered by initial planning, organizing and directing efforts. It is the control function of management that reveals and feeds back necessary information for indicating managerial weaknesses and for removing them by remedial actions.

### Facility of Coordination

Coordination is facilitated by the control function of management. In the context of predetermined goals, control keeps all activities and efforts within their fixed boundaries and makes them to move towards common goals through coordinated directives. Determining who needs what information, control becomes instrumental to provide for horizontal communication between chains of command through direct cross contacts. Wastes of time, money and efforts can be successfully avoided through the control function of management.

### Extension of Decentralization

Despite decentralization, a consistent pattern of executive behaviour and action can be maintained by controlling the use and application of standing plans throughout the organization. By requiring subordinates to exercise self-control for regulating their own performance and to refer only exceptional problems to the superior for information, the top management can concentrate on overall planning and control without being buried in minor details.

## SHORTCOMINGS OF CONTROL

The control system is not an all-cure device and has a number of shortcomings.

### Lack of Satisfactory Standards

There are many activities involving intangible performance for which no satisfactory standards can be established. Hence, quantification of output and identification of the level of achievement are not always possible.

### Imperfections in Measurement

Intangible performance creates difficulties in measuring results for evaluation. Behavioural activities are evaluated by executive thinking. Moreover, measurement of everything of everybody's work is not feasible on economic ground.

## Limitations of Corrective Action

There are several limitations in taking corrective actions and avoiding mistakes. Operating conditions of a business sometime change by external forces, over which management has no control. To take an example, managerial mistakes in studying the market demand are only known subsequently when products are put in the market. Within the organization, minor deviations are bypassed on the ground of practical expediency—all reasons for deviations are not ascertained because of the cost and time involved in investigation, and persons accountable for bad results cannot be singled out in many situations. Moreover, the lack of authority and absence of timely information may make the corrective actions irrelevant in character.

## Human Reactions to Control

Control invites greater opposition from subordinates because of its interference with their individual actions and thinking. The pressure of work put through controlling results in the reduction of quality of work, ignoring of long-range goals in the favour of short-range ones evading censure through falsifying reports and covering up of inefficiencies in other ways. If the control system is of close and detailed type, it is likely to create more adverse effects among the lower-level managers.

## TOOLS AND TECHNIQUES OF CONTROL

Various tools and techniques are used in organizations to enforce control. Here, we have summarized some commonly used tools. Most commonly used control technique is control chart. A control chart covers following aspect of control functions:

- The concept and the use of control limits and control charts
- Control actions that may be taken in response to a reported variance
- Calculation and evaluation of control ratios

We have discussed about control charts in our chapter on Quality Management Practices. Similarly, other control tools like, PERT, CPM, Gantt chart, etc., have been discussed in relevant chapters.

### Control Ratios

In any business the principle of 3-Es, i.e., economy, efficiency and effectiveness is followed. This requires extensive use of various control ratios to measure the variations between budgeted and actual performance. Similarly, the variance analysis also facilitates the measurement of the impact on profitability and the difference between the actual and standard budget. Capacity, efficiency and activity are the three control ratios. These three ratios measure the resource input, productivity or resource usage and the volume of output respectively. The capacity ratio typically measures the degree of efficient utilization of the labour or human resources in terms of the actual total working hours and their comparisons with



## SUMMARY

Control is an essential part of any organization. It ensures whether actions are conforming to the plans, which is done by comparing the actual performance with the plans. Control is required to be enforced at all levels of management. However, the nature of control differs with the level. There are various systems of control. Managers, by selecting appropriate control systems, try to achieve the results. Control is integrated with planning and control actions, if so required, may call for changing the plans. Organizational structure has to be designed in such a way, so that effective control can be enforced through various controlling tools, else organizations are likely to face the problems in implementing their plans and achieving the desired goals and objectives. In many organizations, control is enforced from the top through Management Information Systems.

## Key Words

**Flexible Control:** Control is made flexible to ensure time to time revision of plans to accomplish objectives. The basic idea is that control should remain workable under the dynamic business conditions including the failure of the control system itself. Flexible plans tend to make the control adaptable to new situations.

**Tactical Control:** Tactical control focuses on assessing the implementation of tactical plans at the departmental levels, monitoring results and taking corrective actions, if necessary. Middle-level managers make use of this control for achieving departmental goals and objectives, meeting departmental programmes and budgets.

**Gantt or Bar Charts:** This technique graphically represents the progress of a project versus the timeframe within which it must be completed. Gantt charts are excellent graphical representations for scheduling the execution of various project activities.

**Feedback Control:** This type of control ensures continuous flow of information relating to actual performance so that deviations are promptly corrected and in time. Information which flows back to the manager for this purpose is nothing but feedback. Feedforward information flows back from the manager to the performers. Information may be feedback informally or formally. Informal feedback is through personal contact, informal discussion and personal observation. Financial statements, reports, statistical analysis and other written communications furnish examples of the formal feedback.

**Control Charts:** Control charts are useful to present variance data over a period of time, in relation to the control limits set.

**PERT:** PERT stands for Programme Evaluation and Review Technique, and it is the most popular network model. Network models are visual aids that may be used to monitor and control activities. They are especially suited for disaster relief programmes because each project is not routine or repetitive.

## REVIEW QUESTIONS

1. Discuss in what way are planning and controlling related?
2. What is feedback and what is feedforward control?
3. Control is all-pervasive function. Do you agree with this statement? Justify.
4. Define strategic control. How is it different from tactical and operational control?
5. Can control function be delegated? Justify your answer.
6. What are the different techniques of control? Which techniques do you recommend most for achieving organizational goals?
7. What are performance standards? How are performance standards decided? How do performance standards help in controlling?
8. Imagine a situation like planning without control. What would be the implications for an organization? Justify your answer.
9. What are the important requirements of a good control system? Discuss with examples.
10. Short Notes:
  - (a) Control Charts
  - (b) Control Ratios
  - (c) Project Evaluation and Review Technique (PERT)
  - (d) Gantt Chart
  - (e) Budgeting and Budgetary Control

## REFERENCES

1. Bhattacharyya, D.K. 2002. *Production and Operations Management*. New Delhi: Excel Books.
2. Bhattacharyya, D.K. 2009. *Organization Behaviour*. New Delhi: Oxford University Press.
3. Koontz, H. 1961. 'The Management Theory Jungle'. *Academy of Management Journal* 4(3): 174-88
4. Ouchi, W. G., and A. M. Jaeger. 1978. 'Type Z Organization: Stability in the Midst of Mobility'. *Academy of Management Review* (April): 305-314.
5. Argyris, C. 1964. *Integrating the Individual and the Organization*. New York: Wiley.

# Coordination in Organizations

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend the nature and characteristics of coordination
- realize the needs, importance and significance of coordination
- know the principles of coordination
- get familiar with the objectives and purposes of coordination
- know various types of coordination
- understand the concepts of internal and external coordination

## INTRODUCTION

Successful planning and organizing alone cannot ensure the accomplishment of organizational goals and objectives. It requires unity of action, which is achieved by harmonizing and synchronizing the group efforts. Unity of action in the pursuit of common purpose is brought into the process of managing by the manager himself while he does the basic managerial functions of planning, organizing, staffing and controlling. Now basic question arises, why unity of action is so important in an organization. This is primarily because of the individual differences in understanding, timing effort or approach towards the accomplishment of organizational goals. The effort of manager to provide unity of action is known as coordination. Coordination is all pervasive and the essence of management. It is management of interdependence in work situations.

## DEFINITIONS

Henry Fayol, L.A. Allen and Ordway Tead consider coordination as a separate management function, while others suggest that coordination is not a separate managerial function; it is in-built with all management functions. Therefore, coordination has been defined by various authorities in various ways. Ordway Tead defined coordination as 'the effort to assure a smooth interplay

the functions and forces of the different component parts of an organization to the end that its purpose will be realized with a minimum of friction and a maximum of collaborative effectiveness.' Henri Fayol laid emphasis on an internal coordination suggesting following three action plans:

- Each department of an organization should work in a proper harmony with the rest
- Each department or division should be informed of its share in the group task
- Working schedule of different departments should be constantly attuned to circumstances

Therefore, within the organization, both vertical and horizontal coordination must be achieved, so that individuals in organization are aware how their functions relate to other functions and how they contribute to the achievement of goals. Vertical coordination is a coordination between the jobs of different individuals as different levels of organizational hierarchy. Horizontal coordination, on the other hand, is coordination between different departments at the same level in a chain of command. We have subsequently discussed the techniques of achieving internal coordination in an organization.

At this stage, it is also important for us to discuss what external coordination is. We are aware that any business organization operates in a dynamic environment. Forces exogenous or external to an organization have great influence on its success and failure. Therefore, coordinating external forces also is important to accomplish organizational goals. We have also discussed separate techniques to achieve external coordination.

According to Newman, 'coordination deals with synchronizing and unifying the actions of a group of people. A coordinated operation is one in which the activities of the employee are harmoniously detailed and integrated towards a common objective.' McFarland defined coordination as a 'process whereby an executive develops an orderly pattern of group effort among his subordinates and secure unity of action in the pursuit of common purpose.' In the same way, Mooney and Reilley defined it as 'an orderly arrangement of group effort to provide unity of action in the pursuit of a common purpose.' Further, Spriegel defined coordination as 'the process of so arranging group activities in relation to time, place and effort that each item will take care of itself according to the need of the situation.'

We have already stated that there exists difference of opinions about attributing coordination as a separate function of management and considering it as inbuilt with all managerial functions like, planning, organizing, staffing, directing and controlling.

## NATURE AND CHARACTERISTICS

From the above definitions, we can list the basic nature and characteristics of coordination as under:

### It Is a Dynamic and Continuous Process

Coordination helps in achieving organizational objectives through coordinated group efforts. Organizational objectives change with organizational budgets and priorities. Budgets being made annually and priorities being changed to keep

pace with the environmental forces, coordination is ever existing, dynamic and a continuous process.

### It Applies to Group Efforts

Coordination is necessary to integrate group activities with the organizational objectives. Both through vertical and horizontal coordination, organizations integrate individuals as well as group activities. Individuals form parts of groups. Hence, it is essentially coordination of group efforts, which we find in organization.

### It Integrates and Harmonizes Diversified Efforts

To achieve goals and objectives, organizations segregate its activities in different parts. Each part of an activity is looked after by individuals working in a group. Such part forms a specific task. Aggregation of task leads to achievement of common goals. Hence, individual efforts need to be harmonized and integrated to accomplish organizational goals. This is achieved through effective coordination.

### It Lays Emphasis on Unity of Efforts

Unity of efforts again is ensured by channelizing individual and group efforts towards accomplishment of organizational objectives. Need for unity of efforts arises due to individual differences in understanding, timing, performing or approaching to accomplish organizational goals. As organization is a total process; without unity of diversified efforts of individuals working in organizations, achievement of results is difficult. Therefore, unity of efforts is achieved through coordination, both vertical and horizontal.

### It Is a Basic Responsibility of Managers

All managers, irrespective of their functional specializations and hierarchical levels, need to coordinate to achieve goals and objectives of an organization. Hence, coordination is a responsibility of all managers, and no one can evade it.

### Coordination Is the Essence of Management

All managerial functions require coordination. Several proponents of coordination concept, instead of regarding coordination as a separate managerial function, regarded it as the essence of management to accomplish group goals. Therefore, coordination is considered as an all-pervasive and permeating function of management, which passes through the managerial functions of planning, organizing, staffing, directing and controlling.

### It Is also Maintenance of Systems

An organization is a system of group efforts. Coordination recognizes the diversity and interdependence of organizational systems and the importance of synthesizing individual and group efforts with the organizational systems. Systems approach considers the organization as a network of mutually dependent parts. Systems concept of coordination ensures integration of such parts for the accomplishment of goals and objectives.

### It Is a Conscious Action

Coordination cannot be achieved spontaneously. It emanates from conscious and concerted action of management.

### It Avoids Interruptions of Operations

Interruptions of operations may arise due to several reasons. Coordination helps in avoiding such interruptions to achieve organizational goals on time.

### It Eliminates Overlapping or Duplication of Work

Coordination can eliminate such problem and thereby optimizes resources of an organization.

Based on the above characteristics of coordination, we can summarize, in line with Mintzberg, following six valid coordinating mechanisms in organizations.

- Direct supervision
- Standardization of work
- Standardization of skills
- Standardization of outputs
- Mutual adjustments
- Standardization of norms

Direct supervision is more visible for entrepreneurial organizations. In machine organizations, we find the practice of standardization of work. In professionally managed organizations, standardization of skills is visible. Standardizations of outputs are evident in diversified organizations. For innovative organizations, a mutual adjustment is more practised. Finally, for missionary organizations, we find standardization of norms to follow the principles of equity.

### NEEDS, IMPORTANCE AND SIGNIFICANCE OF COORDINATION

So far we understand coordination as a primary method of synchronization to avoid interruptions of operations and to ensure unity of action among individuals and groups, which together help to accomplish organizational goals. Needs, significance and importance of coordination are many. Basically, we can cluster such needs in three categories as under:

- Division of labour
- Interdependence of units
- Integration of individual with organization

In another way, such needs can be understood in the following ways:

- Coordination is important because of growth in size of organization
- Coordination is important because of growing specialization
- Finally, it is important due to diversity of human nature

Here, however, we have discussed needs, importance and significance of coordination point wise as under:

#### Specialization

Principles of division of labour and specialization require segregation of organization into different parts. However, all these parts are functioning towards achieving

a common goal or goals. Integration of these segregated parts of organization requires coordination. Coordination, therefore, is important due to work or job specialization.

### Unity of Action

Coordination is important because it provides unity of action of diversified resources, skills, activities and perceptions. Diversity is inherent in an organization due to the difference in human attributes and characteristics. Through coordination, we reduce such diversity and restore unity of action to achieve intended organizational goals.

### It Balances Unequal and Restores Teamwork

Coordination is important because it balances inequalities and restores teamwork. Individual differences create imbalances, thereby making it difficult to accomplish organizational goals. Through coordination we enforce teamwork in organizations. Team work balances unequal factors and achieves organizational goals.

### It Helps in Harmonizing Individual and Organizational Goals

Individual goals are largely influenced by individual needs. Hence, it may be different from group goals and organizational goals. Conflict between these goals may be deterrent to accomplish desired results. Coordination, through the process of harmonization, integrates individual goals with organizational goals, and that is why coordination is so important for an organization.

### It Is Important for Differentiation and Integration

Coordination helps in synergizing differentiated work units and authority to achieve the integrated effects. Differentiated work units and authority centres are inevitable in an organization for obvious reasons of specialization mentioned earlier. Achieving synergy is possible through coordination as it helps integration even in differentiation.

### It Reduces Personality Conflicts and Eliminates Organizational Rivalry

Complexity of individual characteristics creates personality conflicts. Such conflicts automatically develop rival groups. Coordination helps in eliminating such conflicts and rivalry by developing a friendly and cooperative relationship. Conflicts and rivalry are counter productive. Hence, elimination of these two deterrent situations from organization through coordination is very important.

### Interdependence

Even though an organization works by segregating its activities into different functional areas, interdependence of each and every function ultimately helps in accomplishing the organizational objectives. Without coordination, such interdependence cannot be achieved. Similarly, interdependence also promotes mutuality in an organization. Mutuality involves relating and interrelating with people

positively. It develops cooperation and fosters a culture where everyone strives to win for himself and also for the team.

### Coordination Promotes Employeeship

Employeeship brings changes in the balance of power in the relationship between employer and employee. Responsibility, initiative, loyalty and commitment are the values which every organization aspires to achieve and tries to inculcate in their workforce. Employeeship by reducing the power imbalance develops such values, which enable employees to take responsibilities, develop loyalty, initiative and ultimately align company goals with individual goals by developing a shared vision.

### Coordination Promotes Employees' Competence

Coordination also develops self-managed team and leadership-linking strategy with the individual employee's knowledge by developing a knowledge pool. This helps an organization to enhance the competence of their employees and ultimately makes it possible for them to respond to the competitive environment. All these points, therefore, amply illustrate that coordination is important prerequisite for success of any organization. Without coordination, it is difficult to achieve the desired goals. This is why Chester Barnard opined, 'The quality of coordination is the crucial factor in the survival of an organization.'

### Other Important Functions

- Coordination is important to overcome unhealthy human nature
- Coordination promotes synergy within a group which helps in accomplishing even in excess of the standard rate of individual performance
- Coordination helps a growing organization by developing an effective network of huge number of people working in an organization

### PRINCIPLES OF COORDINATION

Fundamental principles of coordination have been enunciated by Mary Parker Follet, focusing on the following aspects:

#### Direct Control

Direct personal contacts help to coordinate activities of different individuals. It helps in bringing agreement on different managerial actions and decisions duly clarifying possible misunderstandings of employees. Therefore, direct contact is considered as the most important principle of coordination.

#### Early Start

To achieve success, coordination is more effective in the early stages of planning and policy framing. Through coordination, employees are involved in these two processes, which because of its essence of participation, enhances commitment from employees. Coordination at the execution stage is not effective obviously because people working in organization lack their commitment for their

non-involvement. Therefore, direct contact should start right from the beginning so that all cross-sections of employees working in an organization are made aware about the plans and programmes beforehand. This ensures proper execution of the plans.

### Reciprocity

This principle of coordination requires relating men, materials and environment with the organizations reciprocally. In a total situation, all factors are reciprocally related. To illustrate, when A works with B and B in turn works with C and D, all of them are influenced by the others and, therefore, contribute to the total situation. Due to this reason, the principle of reciprocity is important for coordination.

### Continuity

Coordination is a continuous process. It never ends. This is because the ultimate aim of coordination is to achieve organizational goals, and every organization operates in a dynamic environment. Hence, environmental forces, which set the competitive arenas for an organization, are to be aligned with the organizational goals, which keep on changing. Every manager, therefore, constantly works to achieve coordination. This is why the principle of continuity is so important for coordination.

Apart from the above principles, enunciated by Follet, we can also list following important principles of coordination:

- Principle of pervasiveness
- Principle of unity of action
- Principle of subordination of individual interest to organizational interest
- Principle of unity of command and direction
- Principle of teamwork
- Principle of mutuality
- Principle of employeeship
- Principle of synergy
- Principle of integration
- Principle of interdependence

### OBJECTIVES AND PURPOSES OF COORDINATION

Every organization intends to achieve some purposes or objective through coordination. While explaining needs, significance and importance of coordination, we have also listed the objectives and purposes, which an organization seeks to realize through coordination. Here, however, we briefly list such purposes under five major categories:

- Reconciliation of goals by eliminating conflict
- Total accomplishment through synergy. Total accomplishment exceeds the sum of individual efforts. It means individual efforts of some employees when added, it would be less than their total achievement through

coordination, as coordination eliminates duplication of correlation of activities

- Another purpose of coordination is to achieve economy and efficiency as the avoidance of duplication of efforts lead to save wastage of men, materials and machine
- Coordination also achieves good personal relations, which enhance employees' morale and productivity and through job satisfaction increases their level of intrinsic motivation
- Some organizations also intend to achieve the purpose of employee turnover through coordination. High employee turnover means less retention, which is not a desirable situation

### TYPES OF COORDINATION

While introducing the concept of coordination, we have discussed about the following types of coordination:

- Vertical Coordination
- Horizontal Coordination
- Internal Coordination
- External Coordination

#### Vertical Coordination

Vertical coordination is the coordination between different levels of the organization to ensure that all levels of organization are in harmony with the organizational policies and programmes. This is achieved through delegation of authority by directing and by controlling.

#### Horizontal Coordination

Horizontal coordination is the coordination between departments on the same level of managerial hierarchy. Coordination between production and marketing departments at the same level or organizational hierarchy is an example of horizontal coordination. This is achieved by forming cross-functional teams and self-managed teams.

#### Internal Coordination

Vertical and horizontal types of coordination, if carried out within an organization, are called internal coordination. Internal coordination is achieved through following techniques:

#### Coordination through Effective Supervision

Supervision ensures harmonious and reciprocal performance of subordinates. It also synchronizes and coordinates subordinates' efforts both among themselves and in relation to other groups. Such collaborative efforts of individuals and groups to achieve organizational objectives are possible through coordination, which again is best achieved through supervision.

### **Coordination through Organizational Process**

Suitable organizational process achieves coordination. Proper grouping of activities, assignment of job to the subordinates, proper authority delegation, etc., are parts of the organizational process, which helps in achieving coordination.

### **Coordination through Personal Contact**

Another important technique of achieving coordination is through personal contact. Personal contact reciprocally relates one function with another and this is achieved through the development of interpersonal and horizontal relationships of people working in the organization. This promotes cooperation and collaboration due to mutual understanding; hence, coordination through personal contact is significant for realizing the objectives of an organization.

### **Coordination through Effective Communication**

Transparency through communication achieves coordination. Keeping people in the organization informed time to time about the internal and external changes is essential to make them understand the changed situation and coordinate their efforts to achieve intended goals. Communication can be made through letters, documented procedures, reports, bulletins and also through personal behaviour of managers. Communication does the important task of dovetailing information for the benefit of the organization. People react to the communication quickly, provided it is properly coordinated. This is why effective communication is considered to be an important technique of coordination.

### **Coordination by Group Meetings**

Henry Fayol pointed out that lack of coordination is more visible when each department knows nothing about others or fails to relate them to the organization as a whole. This is primarily for the existence of water tight compartments for the traditional hierarchical structure, where people lack initiative and loyalty. To eliminate such a situation, coordination is essential which can be best achieved by periodic group meetings and conferences of departmental heads. Group meetings help people to understand the organizational needs better. It helps them to exchange ideas, know about plans and activities of their department and so also the organization as a whole. Proper coordination, therefore, is best achieved through group meetings, and this is why group meetings are considered to be an important technique of coordination.

### **Coordination through Liaison Officers**

Particularly for large organizations, direct personal contact of managers of various units and functions may not be very frequent. Such gap is often filled by the organizations through liaison officers. Therefore, also by appointing liaison officers, an organization seeks to achieve coordination.

### **External Coordination**

Success or failure of an organization also depends on number of external forces. No organization can operate in isolation, it has to continuously interact with dynamic environmental forces and devise its strategies to respond to such forces to survive.

External coordination facilitates such process by integrating the organization with the dynamic external forces. For effective external coordination, an organization at the outset has to know what the pertinent external forces are. After such identification, the organization has to analyse their potential impact and take suitable remedial to preventive measures to cope with the same. Important external forces may be the changing expectations of stakeholders (like suppliers, customers, investors, employees or even the society) or changing competitive situation, technological advancement, changing government policies and regulations, etc. To facilitate external coordination, a number of techniques are adopted by an organization. New management concepts like, customer relationship management (CRM), which aligns organization with the customers, supply chain management (SCM), which increases market share and multiply customer satisfaction, etc., have now been developed for more effective external coordination.

### **TOOLS FOR BETTER COORDINATION**

Apart from the aforesaid techniques, an organization must lay importance on the suggestions made by Watten Newman. He suggested following techniques or measures as tools for achieving better coordination:

- Simplified organization with clear cut procedures and a network of formal and informal relations among people by grouping various functions into homogenous and non-overlapping units help to achieve better coordination
- Harmonized programmes and policies to coordinate right at the planning stage itself. Involving people at this stage facilitates re-examination and checking of programmes and policies against the others, which integrate to the organization as a whole. Therefore, also by harmonizing programmes and policies we can effectively coordinate
- Well-designed methods of communication to achieve better coordination
- Voluntary coordination by instilling objectives among the members of the groups, developing generally accepted customs and terms making it easy for people to work with one another, encouraging internal contacts to supplement formal communication, providing liaison officers and finally using committees to promote personal contact and informal exchange of ideas and views
- Coordination through personal guidance by playing the role of a mentor to coordinate the task of their subordinates. Personal guidance is also considered as an important technique for achieving coordination

### **SUMMARY**

Coordination is essential for achieving intended goals and objectives of an organization. While there exist differences of opinions about calling it as a separate function of management, management thinkers, however, agree unanimously about its importance. There may be disagreements about its various functions, however, for a proper functioning of an organization, a manager has to coordinate with his fellow employees. There are a number of tools and techniques to coordinate. Manager has to carefully select the tools and techniques to achieve the internal and external coordination.

## Key Words

**Unity of Action:** Unity of action is ensured by channelizing individual and group efforts towards the accomplishment of organizational objectives. The need for unity of action arises due to individual differences in understanding, timing, performance and or approaches towards organizational goals. Since, organization is a total process, achievement of results is difficult without unity of diversified action or efforts of individuals working in organizations. Therefore, this is achieved through coordination, both vertical and horizontal.

**Horizontal Coordination:** Horizontal coordination is the coordination between departments on the same level of managerial hierarchy. Coordination between production and marketing departments at the same level or organizational hierarchy is an example of horizontal coordination. This is achieved by forming cross-functional teams and self-managed teams.

**Employeeeship:** Employeeeship brings changes in the balance of power in the relationship between employer and employee. Responsibility, initiative, loyalty and commitment are the values which every organization aspires to achieve and tries to inculcate in their workforce. Employeeeship by reducing the power imbalance develops such values, which enable employees to take responsibilities, develop loyalty, initiative and ultimately align company goals with individual goals by developing a shared vision.

**Vertical Coordination:** Vertical coordination is the coordination between different levels of the organization to ensure that all levels of organization are in harmony with the organizational policies and programmes. This is achieved through delegation of authority by directing and by controlling.

**External Coordination:** An organization has to continuously interact with dynamic environmental forces and devise its strategies to respond to external forces to survive. External coordination facilitates such process by integrating the organization with the dynamic external forces. For effective external coordination, an organization at the outset has to know what the pertinent external forces are. After such identification, organization has to analyse their potential impact and take suitable remedial to preventive measures to cope with the same. Important external forces may be the changing expectations of stakeholders (like suppliers, customers, investors, employees or even the society) or changing competitive situation, technological advancement, changing government policies and regulations, etc. To facilitate external coordination, a number of techniques are adopted by an organization.

**Principle of Reciprocity:** This principle of coordination requires relating reciprocally men, materials and environment with the organizations. In a total situation, all factors are reciprocally related. To illustrate, when A works with B and B in turn works with C and D, all of them are influenced by the others and, therefore, contribute to the total situation. Due to this reason, principle of reciprocity is important for coordination.

**Internal Coordination:** It is coordination within the organization between various departments. It is embedded with the basic definition of coordination. It develops a clear direction and strategy for the organization.

## REVIEW QUESTIONS

1. Explain the term coordination. Why is it important for an organization?
2. What are the important characteristics of coordination?
3. What are the important principles of coordination? Are such principles common to all types of organizations?
4. What are the important objectives achieved by an organization through coordination?
5. Explain different types of coordination. What is the difference between internal and external coordination?
6. Explain different tools and techniques for achieving coordination. Is there any difference between internal and external coordination tools?
7. 'Coordination is the essence of management!' In the context of this statement discuss the relationship between coordination and managerial functions.
8. Short Notes:
  - (a) Coordination and Cooperation
  - (b) Horizontal Coordination
  - (c) Vertical Coordination
  - (d) Unity of Action
  - (e) Voluntary Coordination

## REFERENCES

1. Bhattacharyya, D.K. 2005. *Business Management*. Kolkata: Santra Publications.
2. Bhattacharyya, D.K. 2009. *Organizational Behaviour*. New Delhi: Oxford University Press.
3. Allen, Louis A. 1973. *Professional Management*. New York: McGraw-Hill Book Co. Inc.
4. Brech, E.F.L. 1953. *Principles and Practice of Management*. London: Longman, Green & Co.
5. McFarland, Delton, E. 1970. *Management Principles and Practices*. London: The Macmillan Co.
6. Newman, Watten. *The Process of Management*. New Delhi: Prentice-Hall of India Pvt Ltd.

## Forms of Organization

### LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand various forms of organization
- realize the advantages and disadvantages of various forms of organization
- comprehend the meaning of multinational and transnational organization
- know the concept of globally integrated enterprise

### INTRODUCTION

A business organization may be owned by one person or a group of persons. If it is owned by one person, it is known as sole proprietorship. Other than this, all other forms of business organizations are known as group ownership like joint Hindu family firm, partnership firm, joint stock company (public or private), cooperative undertaking, etc. Government-managed organizations again may be either a departmental undertaking, government undertaking or a government enterprise. Organizational structure and systems largely depend on the type of organizational forms. To take an example, a sole proprietorship organization, being operated in a small scale, may follow a highly centralized decision-making systems and a flatter or horizontal structure, so that the owner or proprietor can lay hands on the day-to-day business activities. As a sole proprietor, who is involved in day-to-day business activities, he may prefer a wider span of control. In contrast to this, the organizational structure and systems may be altogether different for other forms of business organizations. For operational flexibility, even a professionally managed large public limited joint stock company may like to follow a bureaucratic type hybrid structure, which is followed mostly by the departmental undertakings (wholly owned by the government).

### SOLE PROPRIETORSHIP

This is the single ownership form of business. A sole proprietor runs his/her business as an entrepreneur and is personally responsible for all business outcomes, which includes personal obligation for all liabilities. It means a creditor can raise the claims against a sole proprietor, as his/her liabilities are unlimited. When a sole proprietor chooses to carry out business under a different name of his/her firm after the formal registration, it cannot immune himself/herself from the personal obligations/liabilities.

Thus, sole proprietorship is the most common form of business organization.

#### Advantages of Sole Proprietorship

1. It is relatively easy and less expensive to form and administrate.
2. It enjoys maximum managerial control
3. It enjoys tax advantages, as the business income is taxed as the personal income of the sole proprietor

#### Disadvantages of Sole Proprietorship

1. It cannot raise adequate capital, required for business expansion. This is primarily for the reasons that a sole proprietor is considered more as an individual than a separate business entity, unlike in other forms of business
2. A sole proprietor suffers from the problem of unlimited liability
3. A sole proprietor cannot easily transfer the ownership
4. A sole proprietorship firm has limited life, as with the demise of the owner, the firm dissolves

As the sole proprietorship firm is owned and operated by an individual, this type of organization ensures highest managerial control. When the size of a sole proprietorship organization is small, the owner personally get involved in all aspects of business functions like, purchase, inventory control, manufacturing/production or operations, accounting and finance, human resource management, customer relationship management and all other general management issues. When it grows, owners may find it difficult to lay hands in all aspects of the business. In such cases, owners are required to hire helping hands to share the control of business activities. Some owners, however, by nature do not like to share the control of business, even in cases when they become large, resulting in disruption of business activities.

Since a sole proprietorship organization is owned by a single individual, the business gets restricted for the obvious problem of availability of financial resources, which may stand against the growth and business diversification. In today's competitive market, even a small sole proprietorship organization requires building of capital for the purchase of all the required fixed assets like, land, equipments, etc., and to meet the operating expenditures like wages, salaries, payment of electricity bills and payment to suppliers or vendors. Paucity of funds may restrict a sole proprietor to scale up his business activities, which virtually put him into a resource-crunch situation because self-financing ability may not

be always strong enough to cater to rising business investment and expenses and also borrowing money from intermediaries to finance the business activities may not always be cost-effective. All these hinder the business expansion plan of sole proprietors and force them to scale down their activities.

Another major constraint in such type of organization is its limited life-span. In India, many well-known sole proprietorship organizations have to wind up with the death of the promoter, i.e., the owner of the organization.

### PARTNERSHIP

It is a business, owned and operated by two or more individuals. Theoretically, two or more persons enter into a partnership agreement to combine their resources in a business with the objective to make profit. Persons who are entering into agreement are known as partners, and collectively they are known as partnership firm or organization, which may have different names. In case of partnership firms, like in sole proprietorship, partners provide capital and share the responsibility for running the firm on agreed basis. In partnership agreement, it may be such that some may invest in terms of monetary resources, while some other may take the responsibility of running the business. Such terms and conditions are spelled out in the partnership deed. Hence, characteristically in partnership firm, we find involvement of two or more persons, contractual relations between the persons, lawful business, sharing of profit, agency relationship, unlimited liability and nontransferability of interest.

#### Advantages of a Partnership Organization

1. It is an easy and inexpensive form of business organization and is also easy to operate and administer
2. It enjoys the potential of large managerial control
3. Its income is taxed as the ordinary personal income of the partners
4. It relatively enjoys the potential of raising adequate capital to finance the business

#### Disadvantages of a Partnership Organization

1. Relative difficulty in raising capital like a joint stock company
2. Problem of unlimited liability
3. Difficulty to transfer ownership
4. Limited life

It is, therefore, apparent that advantages and disadvantages of partnership forms of business organization are more or less similar to that of sole proprietorship.

In partnership forms of business, managerial control rests on the partners. Responsibility of managerial control on partners become more significant, when the size of the firm is relatively small. However, with the increase in number of partners, such responsibility gets reduced. Characteristically, we often find conflicts among partners in partnership forms of business. When such conflicts increase to an unmanageable limit, the partnership firms get dissolved. This is because resignation of one partner, dissolves the partnership agreement. Due to this reason,

often we find the lifespan of a partnership organization becomes less than the lifespan of a sole proprietorship organization.

### JOINT STOCK COMPANY OR CORPORATION

A joint stock company is identified by the terms 'Limited', 'Ltd', 'Incorporated', 'Inc.', 'Corporation', or 'Corp.'. Irrespective of the term used, it must appear with the corporate name in each and every document, exactly in the form and manner it appears in the document of its incorporation. As it is a legal entity distinctly separate from the owners and managers, it can, like any other legal entities, own assets, incur liabilities and engage in activities. In a joint stock company, ownership is represented by shares, which may either be a general equity or a preferential equity. General equity shares confer ownership rights to the shareholders. Such shareholders get dividend, as declared by the company. They can vote to elect the board of directors and the auditors of the company and can also participate in the general meetings of the company. Preference shares are capital stocks, which provide specific dividend before the dividend is paid to common or equity shareholders. Such dividend is payable at a predetermined rate irrespective of the company's profit or loss. However, such shareholders do not enjoy any voting rights like the common or equity shareholders. Also preference shareholders enjoy the privilege of getting their obligations first met, in the event the company goes bankrupt. Usually, there are four different types of preference shares, i.e., cumulative preferred, non-cumulative preferred, participating and convertible.

#### Advantages of Joint Stock Corporation

1. Ownership of a joint stock company is transferable
2. People who own the shares of the company can dispose their stake and in the process those who acquire such shares become the owners
3. With the demise of the present equity holders, their legal heirs become the owners, as shares may be transferred in their names. Such characteristic features, i.e., easy transfer of ownership, separate legal entity and limited liability of a joint stock company, together create the organizational structure, which can combine several activities and functions in a well-coordinated framework
4. It can raise adequate capital, both by issuing equity shares and taking long-term loans from financial institutions
5. Shareholders in a joint stock company need not be involved in the management of the organization

#### Disadvantages of Joint Stock Corporation

1. Formation of a joint stock company is quite complicated.
2. Due to its separate legal entity, it requires incorporation, complying with all required statutory provisions. In India, such incorporation formalities and other statutory compliance for the formation of joint stock company is regulated by the Companies Act, 1956. Some companies may prefer to operate in closely held conditions and, therefore, prefer to form a private limited entity, restricting the number of members to a minimum of two and a maximum of fifty. They are known as private limited companies.

Some, however, prefer to form public limited company, with a minimum seven and maximum any number of members. In such cases, they become widely held organization, with shareholders even worldwide.

3. All such organizations are governed by a duly appointed board of directors.

Apart from the classification of joint stock companies into private or public limited, we can also have companies with government stake. To take an example, a wholly government-owned organization is known as departmental undertaking. An erstwhile private or public limited company taken over by the government (a case of nationalization) is known as government undertaking, whereas, a new company formed jointly by the government and private promoters is known as government enterprise. These apart, we have joint Hindu family organization, governed by the Hindu Law, multinational and transnational organizations. Joint Hindu family organizations are inherited and headed by the Karta. Multinational or transnational companies expand their business even beyond their own country where they are incorporated.

### COOPERATIVE ORGANIZATION

Cooperative organizations are those organizations, which are different from the rest, as they are formed not for the purpose of making profit but to provide its members goods and services at reasonable rates. This form of organization primarily protects and safeguards the economic interests of its members. Thus, cooperatives are voluntary associations, formed with a service motive; the primary source of income being the members' shares, they get dividend on trading surplus, if any. The organization functions as a separate legal entity in a democratic way and is governed by the state regulation. There are different types of cooperatives like consumers' cooperatives, producers' cooperatives, marketing cooperatives, housing cooperatives, credit cooperatives, farming cooperatives, etc. The structure of a cooperative organization ensures:

- All members have an equal say (one vote per member, regardless of the number of shares held)
- Open and voluntary membership
- Limited interest on share capital
- Surplus is returned to the members according to amount of patronage

#### Advantages of a Cooperative Organization

1. A cooperative organization is owned and controlled by members
2. It has a democratic control: one member, one vote
3. This type of organization has a limited liability
4. Profit distribution (surplus earnings) to members is carried on in proportion to the use of service; surplus may be allocated in shares or cash

#### Disadvantages of a Cooperative Organization

1. A cooperative organization entails longer decision-making process
2. It requires members to participate for success
3. Extensive record keeping is necessary in this form of organization

4. It has less incentive, and there's also a possibility of development of conflict between members

### MULTINATIONAL/TRANSNATIONAL ORGANIZATIONS

Multinational organizations are divided into three broad groups as per the configuration of their production facilities. *Horizontally integrated multinational corporations* manage production establishments located in different countries to produce the same or similar products, as for instance McDonald's. *Vertically integrated multinational corporations* manage production establishment in certain country/countries to produce products that serve as input to its production establishments in other country/countries. Adidas is an example of this kind of integrated multinational cooperation. *Diversified multinational corporations* do not manage production establishments located in different countries. They need not be horizontally or vertically integrated (example, Microsoft or Siemens A.G.).

There is no single agreed-upon definition of the multinational (or transnational) enterprise. MNCs are companies or enterprises that operate in a number of countries and have production or service facilities outside the country of its origin. A commonly accepted definition of an MNC is that it is an enterprise producing at least 25 per cent of its output outside its country of origin. A multinational corporation (MNC) is a body that has an integrated philosophy encompassing domestic and global operations. The term is interchangeably used with multinational enterprise (MNE) or transnational corporation (TNC). It is an organization that has its facilities and other assets in at least one country other than its home country. Such companies have offices and/or factories in different countries and usually have a centralized head office where they coordinate the global management. Very large multinationals have budgets that exceed those of many small countries.

Most of the multinational corporations are based in developed countries. They try to maintain their domestic identity, maintaining their central office in their country of origin, while functioning their back offices functions in countries where they operate. Using such model they become globally integrated enterprise.

#### Advantages of MNCs

1. With more investment and increase in economic activity, MNCs generate more employment. In the process, an MNC enhances the new production facilities and brings positive changes in the local economy
2. MNCs improve the balance of payments of a country. Balance of payments, i.e., positive foreign exchange position, occurs with the direct inflow of capital, which leads to import substitution and export promotion
3. MNCs facilitate transfer of technology and in the process benefit the local economy to enjoy efficiency and effectiveness in the factors of production
4. Helps in generating revenues for the government of the beneficiary countries through taxation. MNCs' tax payouts benefit the country to spend more on public expenditures on infrastructure development and bring positive changes in the economy
5. Substantially help in saving precious foreign exchanges

## Disadvantages of MNCs

The disadvantages are described as follows:

### Uncertainty

MNCs often scale down their production facilities and close the operations in situation of economic uncertainty. They practise hire and fire; hence, people employed in MNCs often lose their jobs. Such uncertainty may lead to internal problems in the country.

### Control

MNCs often exert control over the local government, both economically and politically. Such control may even go against the interest of the nation as a whole.

### Transfer Pricing

This is done by lowering the internal price structure. Through this, MNCs can reduce their profits in the countries, where they operate and thus deprive their host countries from the legitimate tax payouts.

### Environmental Imbalance

MNCs can create environmental imbalances extracting natural resources and polluting the environment of the host countries.

### Killing Domestic Producers

MNCs can kill the local organizations while competing with the local firms.

### Profit Repatriation

MNCs may repatriate their profits to their own country of origin, and thereby, deprive the host countries from the benefit of new investment.

## Tentative List of Multinational/Transnational Companies

ABB	Cummins	ICICI
ABN-Amro	Daimler-Chrysler	Infosys
Accenture	Danone	Ingersoll Rand
Accer	Dell	ING Group
Activision Blizzard	Dow Chemical	Intel Corporation
Aditya Birla Group	EA	Isuzu
Affiliated Computer Services Inc.	EDF	Jardine Matheson
Airbus	Electronic Data Systems	Johnson Controls
Air France-KLM	Electrolux	Johnson & Johnson
Akzo Nobel	Emerson Electric	JPMorgan Chase & Co.
Alcatel-Lucent	Eni	Konami

(Continued)

Allianz	Enel	KPMG
Alstom	Embraer	Krispy Kreme
Altria Group	Epson	Kronos Inc
American Express	Ernst & Young	Lagardère
Apple Inc.	Etisalat	Lactalis
Aquent Ilc	ExxonMobil	Lear
ArcelorMittal	Faber-Castell	Leoni AG
Arcor	France Télécom	Lesaffre
Assicurazioni	Ferrero	Lexmark
Generali	Fiat	LG
Atari	Ficosa	Lockheed Martin
AXA	Finmeccanica	L'Oréal
Bacardi	Ford Motor Company	Luxottica
Banco Santander	General Electric	McDonalds
Bank of Montreal	General Motors	Malaysia Airlines
Barrick Gold Corporation	Gerda	Martini & Rossi
Barilla Group	Gillette	Masterfoods
BASF	GlaxoSmithKline	Matsushita
Bayer	Google	Microsoft
BBVA	Halliburton	Millipore Corporation
BIC	Hearst Corporation	Monsanto
Billabong	Heineken	Nestlé
BMW	Hewlett Packard	News Corporation
BNP Paribas	Hindustan Computers Limited	Nike Inc.
Boeing	Hitachi Ltd.	Nintendo
Bombardier	Honda	Nissan
BP (British Petroleum)	HSBC	Novartis
Cadbury Schweppes	Huawei	Parmalat
Capital One	Hutchison Whampoa Limited	PepsiCo
Caterpillar	Red Bull	Schlumberger
Celestial	Reebok	Scotiabank
Centocor	Regus	Shell
Chevron	Renault	Siemens
Citigroup	Shell/Royal Dutch	Sony
ConocoPhillips	Royal Bank of Canada	Société Générale
Coca-Cola	Samsung	Square Enix
Costco	Sanofi Aventis	Suez
Creative Labs	Sasken Communication Technologies Limited	Syntel
Credit Suisse		Techint (Tenaris/Ternium)
CUBS		Telefónica
UniCredit		

(Continued)

Unilever  
Veolia  
Virgin Group  
Crédit Agricole  
Woodbridge Foam  
Xerox  
Tata Group

The Walt Disney Company  
The Toronto Dominion Bank  
Toshiba  
Total S.A.  
Toyota  
Wal-Mart Stores Inc.  
Wipro Ltd.  
Volkswagen  
Yahoo!

Tesco  
Texas Instruments  
Videocon  
Vodafone  
Yakult

### Transnationalism

The term 'transnationalism' indicates specific strategies of MNC/TNC to control production facilities in more than one country through direct foreign investment. A very recent example is Ford and General Motors. These companies enjoy specific advantage of global market, availing low-cost transshipment of their finished goods in markets where they can get a bargainable price. To take an example, in China many multinationals have their own production facilities not for China market but for other markets, where the price offer is competitive.

### Micro-Multinationals

Organizations of this type try to become global through Internet-based communication tools. Basically, they are small business entities (mostly software companies) and coordinate their activities across the borders through Internet. They establish their dispersed virtual business with the employees, clients and resources located in various countries. They enjoy economy of scale, as their cost of operation becomes relatively less for the use of cheaper Internet, telephony and lower travelling costs. Hence, this type of organizations quickly grow, creating unique business opportunities.

### Globally Integrated Enterprises

The globally integrated enterprise is a term coined in 2006 by Sam Palmisano, the CEO of IBM Corp. This type of enterprises strategically integrates their production and value chain worldwide. This is also known as the multinational model of the 20th century. For IBM, this was a successful model to grow internationally, understanding customers, local market requirements and cultivating local talent. Now such enterprises can locate functions anywhere in the world, based on the right cost, skills and environment. Palmisano mentions the *Law of Global Integration*, driven by three forces—economics, expertise and openness.

### FEATURES OF INTERNATIONAL ORGANIZATIONS

In a global economy, international competition, primarily through multinational and transnational organizations, plays a pivotal role. In developed countries like USA, 70 to 85 per cent of economy is influenced by multinational organizations.

Managing these types of organizations requires philosophies and systems, which are different from domestic organizations. International business operations can take several different forms. Four basic types of international organizations differ in the degree of international activities. A typical MNC has autonomous units that operate in several countries. Shell, Phillips and IIT are three typical examples of MNCs. They give autonomy to their subsidiaries in different countries to run their business independently. Subsidiaries are empowered to manage local issues like taste and preferences of customers and design of new products accordingly. Adoption of strategies to tackle political pressures and economic trends. The degree of such independence even extends to non-integration with the MNCs' headquarter. The global corporations, another form of MNC, maintain control of operations, as they treat the world market as unified whole. Companies like Matsushita and NEC, considered world market as a unified whole and this way they tried to maximize their efficiency on a global scale. Typically, these companies function like a domestic company, except that they view the world as their market place.

A transnational corporation achieves both the local responsiveness of an MNC and at the same time the efficiencies of a global organization. They make use of networked structure to coordinate their specialized facilities located around the world. In this way, transnational organizations provide autonomy and independence to their units across the world, making all the units as integrated whole. The good examples of transnational companies are Ford, Unilever and British Petroleum. Micro-multinationals are small MNCs, who usually confine to single or specific products or services. BIC pen of USA could be a good example, as it only produces use-and-throw pen for almost half-a-century.

Primary features of these forms of organizations are that they are strong enough to influence the world economy in following ways:

- Production and distribution extending beyond national boundaries
- Systematic transfer of technology among the units located in different countries
- Direct investments in several countries
- Capability to influence the balance of payment of countries of their operation
- Capability to exert political impact
- Capability to overcome the barriers of nationalism

### SUMMARY

Organizations in the form of joint stock companies are gaining popularity throughout the world as the most competent form of business organization for their obvious advantages over sole proprietorships and partnerships. A sole-proprietorship firm suffers from the limitation of capital and managerial inefficiency, although it is easy to form and operate. A partnership firm also may not always be able to scale up their business activities for difficulties in raising the capital. It also suffers from the limitation of managerial inefficiency, whereas a joint stock company, despite regulations and strict corporate governance norms can grow, raising capital from multiple sources. Organizational structure and systems vary with the forms of business

organization. A relatively simple structure is found in sole proprietorship and partnership organizations, while in joint stock companies, the structure is much more rigorous with multiple reporting relationships.

### Key Words

**Multinational Organizations:** MNCs are companies or enterprises that operate in a number of countries and have production or service facilities outside the country of its origin. A commonly accepted definition of an MNC is an enterprise producing at least 25 per cent of its world output outside its country of origin. A multinational corporation (MNC) is a body that has an integrated philosophy encompassing domestic and global operations.

**Transnational Organizations:** A firm which owns or controls production facilities in more than one country through direct foreign investments.

**Globally Integrated Enterprise:** The globally integrated enterprise is a term coined in 2006 by Sam Palmisano, the CEO of IBM Corp. This term is used to denote a company that fashions its strategy, its management and its operations in pursuit of a new goal: the integration of production and value delivery worldwide.

**Micro-Multinationals:** Enabled by Internet-based communication tools, a new breed of multinational companies is growing in numbers. 'How start-ups go global?' These multinationals start operating in different countries from the very early stages. What differentiates micro-multinationals from the large MNCs is the fact that the former ones are small businesses. Some of these micro-multinationals, particularly software development companies, have been hiring employees in multiple countries from the beginning of the Internet era.

### REVIEW QUESTIONS

1. Discuss the advantages of a joint stock company over sole proprietorship and partnership.
2. Discuss the differences between cooperatives and joint stock companies.
3. Discuss the concept of multinational and transnational. How are they different from other forms of organization?
4. Visit the website of any multinational company and study its business activities duly mentioning about the market, product, etc.
5. Short Notes:
  - (a) Family-Managed Business
  - (b) Partnership
  - (c) Preference Shares

### REFERENCES

1. Drucker, Peter. 1954. *The Principles of Management*. New York: HarperCollins Publishers.
2. Dale, Ernest. 1965. *Management Theory and Practice*. New York: McGraw Hill Book.

3. Hofstede, G. 1997. *Culture and Organizations: Software of the Mind*. New York: McGraw-Hill.
4. Massie, Joseph L. 1987. *Essentials of Management*. New Delhi: Prentice Hall.
5. Kooniz, H. 1961. 'The Management Theory Jungle'. *Academy of Management Journal* 4(3): 174-88.
6. Bhattacharyya, D.K. 2005. *Business Organisation*. Kolkata: Santra Publications.

# Introduction to Human Resource Management

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend the meaning and concept of human resource management
- realize the difference between human resource management and human resource development
- understand various facets of HRM and HRD function
- get familiar with the role and significance of HRD
- understand HRD systems, HRD climate and matrix

## INTRODUCTION

In this part, you have to first learn the process of development of Human Resource Management (HRM). Hence, we have to take a brief note on the HRM, especially its different phases of development, conceptual issues, objectives, importance and linkages with other organizational roles. Even though the subject title is Managing People, basically it is concerned with HRM. The subject title of Managing People is in conformity with the international practices. In conformity with the recommendations of Commonwealth of Learning, basic HRM lessons should be covered under Managing People head and advance levels under the head of Human Resource Management (HRM). However, for this, there exists no difference. Thus, we have to understand HRM and HRD and appreciate why HRM has now become so important for us for the successful management of an organization.

## HISTORY OF HRM

Management of Human Resources, as a subject of study even though of relatively of recent origin, the concept upon which the theory is based dates back to 400 BC (Chaldeans Inventive Wage Plans). Since then we find its practices in different civilizations. However, here we are more concerned with the recent history.

Before the industrial revolution, the status of labour was extremely low and the human relationships between the employer and the employees were characterized by slavery, serfdom and the guild system. Slavery was based on the negative incentive system and serfdom was based on positive incentive system. The guild system involving the master craftsmen (the owner), the journeyman (the traveling workers) and the apprentice marked the beginning of the HRM practices for the involvement of selection, training and development of workers and the emergence of collective bargaining over wages and working conditions.

Industrial revolution followed the new economic doctrine of laissez-faire, new industrial organizations, characterized by the factory system (a change from cottage system or home-centred production system), which deteriorated the employer-employee relationship for unhealthy work environment, long working hours, fatigue, monotony, strain, increased likelihood of accidents, etc.

Reviewing the history, it is observed that great thrust had been given to personnel management functions by business expansion, labour strategies and higher wage rates during the World War I (1917). Before this, the thrust was more on Labour Welfare to ensure that workers are not exploited in organizations. This was because of the movement of social activists, political parties and trade unions of different countries who were putting pressure on government of respective countries to come out with legislations pertaining to labour so that they are protected and given their due rights and privileges. Labour welfare officers were statutorily appointed to safeguard the interests of workers. Thus, many of these activities had been initiated then for the welfare and paternalism. Labour welfare officers, then had no managerial role. However, the devastating effect of the World War necessitated an urgent reconstruction of the economy. At the organizational level, there was immediate need to augment productivity. Labour welfare officers, being more proximate to workers, were given the additional role of personnel management so that they can effectively motivate people to contribute more for enhancing productivity. The Great Depression of 1920-21, thereafter threw many personnel men out of jobs, and this created a disillusion for the profession. A number of literatures came up round the world during 1920-22, dealing with different areas of personnel administration. By 1923, it was considered that the profession had reached the stage of maturity, as organizations started giving importance to this profession, recognizing its imperativeness like other core functions, i.e., production and marketing.

## DEVELOPMENT PROCESS OF HRM

Tracing the history, we find that personnel function was derived from the introduction of welfare and charitable activity. Initially, welfare was perceived as a moral duty, but however, in the later period, the welfare was considered as a precondition of the industrial efficiency.

The second phase of development sprung from the employers' endeavors to cope with the challenges of trade unionism. The third phase of development could be attributed to the development of the concept of humanization of work.

Factors which are responsible for the development of this profession from the international perspective can be listed as follows:

Technological changes are taking place at a rapid pace throughout the world. Such changes have a great bearing upon personnel functions because these

technological advances have fundamentally changed the relationship between people and work. Consequently, it has induced a major change in the economic system and the societal structure.

The rising competition both at home and abroad (in cases of international trade), virtually reduces the profit to the level of production cost (unless the organization is monopolist). The free movement of technology from one country to another does not allow any production process to monopolize the particular technology of their use.

The rise of consumerism, government protection, so also the international competition, developed the necessity to maintain the quality and price, which completely redress the opportunity to follow the traditional production method.

Social changes are also taking place at a fast pace. Business function is no longer a mere profit multiplying one. Organization being a part of the society, also owes towards society.

The political development also restructured trade unionism. Trade unionists are no longer a mere wage bargainer.

The structural changes in employment (inclination towards white collared jobs and a gradual decline of unskilled jobs) and changes in sector distribution of employment (more geared to tertiary or service sectors) also brought a great challenge to the employers.

For personnel profession, all these challenges have a great impact on their functions.

Alienating and de-humanizing effect of repetitive and monotonous tasks, in the wake of technological advancement is a universal phenomenon. Effective utilization of human resources under this technological environment is the prime challenge before today's personnel profession. Even in the United States of America, it has been observed that at present level of production, particularly for workers in the service industries, it is estimated only 50 per cent of the potential is available from existing human skills, initiative and energy. About fifty million employees are now considered obsolete in the USA, which includes a considerable number of engineers, IT professionals and technical people. Manpower obsolescence is also faced by Japanese industries. Other industrially advanced countries are also facing similar crisis.

### Developmental Process of Personnel Management in India

The history of evolution and growth of personnel management in India is not very old. The Royal Commission on Labour in 1931 for the first time recommended for the abolition of Jobbers System and appointment of labour officers to deal with the recruitment and to settle their grievances. The Factories Act, 1948 statutorily made it obligatory for the industries to appoint Labour welfare officers. Today, functions of personnel management in India encompass all the professional disciplines like, welfare, industrial relations, personnel administration, human resource development (HRD), etc.

The general functional areas of personnel vis-a-vis HR professionals can be grouped under five major heads as below:

- Determining and staffing for employment needs
- Measuring performance and developing employee potential

- Preserving effective employee-management relationships
- Uncovering and resolving employee problems
- Anticipating and coping with organizational change

The new changes have extended the functional horizon to many. From a legalistic approach it extended to human relations, from a mere passive factor of production, employees are now perceived as human resources. The functional demand, therefore, encompasses many areas like management by anticipation, more use of work teams by small group activities/quality circles, practice of total quality management culture, etc.

### FACTORS RESPONSIBLE FOR DEVELOPMENT OF HRM

The factors, which lead to the development of HRM as a concept, replacing the traditional concept of labour welfare and personnel management, are as follows:

#### Search for Competitive Advantage

The Competitive Advantage School of Thought, pioneered by M.B. Beer and others in 1984 and N.M. Tichy, C. Fombrun and M.A. Devanna in 1984, argued that better utilization of human resources is necessary to achieve the competitive advantage by an organization and by any nation. This theory is based on the premise that human resource being inimitable resource for any organization, ultimate competitive strength of any organization rests on it and not on other factors like, technology, better process, quality, brand image, etc., because all these factors can be duplicated by other competing organizations.

#### Models of Excellence

Study of successful organizations as models of excellence by T. J. Peters and R. H. Waterman (1982) and Rosabeth M. Kanter (1989) evinced the interest of HRM, isolating it from the traditional personnel management functions. Success of one organization became a role model for other organizations, who emulated it for better results.

#### Failure of Personnel Management

Management of human resources as a mainstream management activity has been advocated by B.F. Skinner (1981) and many others as their studies show that the personnel management have failed to promote potential benefits of effective management of people.

#### Decline in Trade Union Pressure

Changing economic and political climate around the world has resulted in the decline of trade unionism. Thus, the pressure of trade unions on the management in an organization reduced considerably. This has necessitated switch in the emphasis on from collective issues (traditional Industrial Relations Approach) to individual and cooperative issues, i.e., the Human Resource Management Approach.

### Changes in Workforce and the Nature of Work

Structural change in the occupational pattern is now a worldwide phenomenon, of which India is also no exception. Technology, increased requirement of skill and knowledge, occupational shifts, restructuring of production, new quality systems requirement, etc., now demand better educated new generation of workers, who obviously have higher expectations from their organizations. Such trend calls for redefining employer-employee relationship associated with Human Resource Management.

All these factors listed above revolutionized the concept of traditional Personnel Management, which is restricted to the utilization of human resources complying mainly with statutes and coping with the challenges of trade unions. This led to the development of HRM as another form of response for sustaining better employer-employee relation.

HRM is a sub-system of the total management system. This is the responsibility of all managers, irrespective of their functions, disciplines and levels. HRM is primarily concerned with the management of people, individual or groups at work, as also their interrelationship. HRD, organizational development (OD) and interpersonal relations (IR) are separate aspects of a broader concept of HRM. However, in reality, each of this concept overlaps in practice and cannot be viewed in isolation. HRM practices, to succeed, must go concurrently with HRD, OD interventions. Sound IR systems cannot be visualized without good HRD practices.

### HRM versus Personnel Management

HRM is a distinctive approach. There are different ways by which it is possible to distinguish HRM from traditional personnel management. These are given in the following:

- The first approach is by simple retitling of Personnel Management, as many companies did by renaming their Personnel Department as HR Department.
- The second approach is by reconceptualizing and reorganizing personnel roles in line with the conceptual framework of Harvard Business School (1985). This could be done by subsuming personnel and labour relation activities in four policy areas, like employee influence, human resource flow, reward systems and work systems, differentiating HRM from personnel management concepts like employee relations, employee resourcing and employee development, pioneered by Institute of Personnel Management, U.K. Thus, it is apparent that HRM concept categorizes employee relations (industrial relations) as a separate strategic function, which falls under the traditional personnel management function.
- The third approach designates HRM as a distinctively different and new approach towards management. This approach integrates HRM into strategic management and emphasizes on full utilization of human resources.

As this stage, it is necessary to develop a definition of HRM. Let us now first define the term human resources. *Human resource is the total knowledge, skills*

*creative abilities, talents, aptitudes, values, attitudes and beliefs of the people of an organization.* There are, however, difference of opinions among many experts as some of them consider human resource is not only the people who are part of the organization, i.e., the direct employees—it includes customers (TQM concepts) and others who are having a variety of other relationships with the organization. TQM is Total Quality Management. It is used as a tool for organizational improvement through the development of people and processes. Integrating the concept of human resource with management, we can define HRM as an approach to identify right people for the right job. It also includes the process of socializing such identified people to integrate them with the organization, train them for increasing their functional skill, develop them for both identified and unidentified future roles, place them in right tasks and roles, motivate them to perform well and inculcate in them a sense of belongingness.

Within the HRM, there are two major activities—the first is concerned with the recruitment, selection, placement, compensation and appraisal of the human resources (personnel functions), more commonly termed as human resource utilization (HRU) function. The other group of functions is directed towards working with the existing human resources in order to improve their efficiency and effectiveness. Such activities are also designed to enable the existing members of the organization to assume new roles and functions. These activities are concerned with the development of the human resources.

### HRD AS A SEPARATE PERSONNEL DISCIPLINE

So far, our discussion centres around personnel functions. At this stage, we will delineate HRD as a separate discipline of personnel management. However, before we go into the details of HRD functions, a brief understanding of the historical process is considered necessary to appreciate the importance of HRD functions in today's organization.

It is believed that Kurt Lewin's (1947) studies of behaviour of small groups and setting up of National Training Laboratories were the first step for HRD as a separate profession. Till late 1940s human resource development was the domain of psychiatrists, psychologists, counselors, nurses. Lewin's efforts furthered the concept of human relations training and the experiential approach. Participants in training groups (T-groups) effectively identified problems, acquired the required skills and also actively collaborated in the problem-solving process. Training group leaders, unshackling their traditional role of instructors, became facilitators and focused on how the individual relates to and interacts with other individuals and with groups. The group leaders gave training on leadership qualities, on handling of conflicts, expression of feeling, giving and receiving of feedbacks, competition and cooperation, approach towards solving of problems and increasing awareness on oneself and one's impact on others.

In 1969, *Handbook of Structured Experiences for Human Relations Training* was published by University Associates giving structured experiences with guidelines for training and development. Subsequent publication of handbooks for group facilitators in 1972 and 1973 furthered the process of training and organizational development vis-à-vis HRD as the recognized area of professional endeavour, delineating HRD as a new profession, encompassing personnel function.

## HRD Concepts

HRD is concerned with an organized series of learning activities, within a specified time limit, designed to produce behavioural change in the learner (Leonard Nadler and Zeace Nadler, 1969). From the organizational context, therefore, HRD is a process, which helps employees of an organization to improve their functional capabilities for their present and future roles to develop their general capabilities to harness their inner potentialities both for their self and organizational development. It also helps in developing organizational culture to sustain harmonious superior-subordinate relationships, teamwork, motivation, quality and a sense of belongingness.

There are a lot of misconceptions about training, education and development functions vis-à-vis HRD. Essentially, HRD activities are designed to make people effective in their present job position, which is a part of training function. However, when the focus is on future identifiable job it becomes a part of education function. For future unidentifiable jobs, i.e., to develop capabilities for a future position or new activities within the organization, which are not very specific at the present stage, it becomes a part of development function.

Without precisely knowing the functions of training, education and development, it would further make it difficult for us to appreciate the objectives, roles and significance of HRD in an organization. In the succeeding paragraphs, we will take a cursory view to these functions before we go for elaborating on other issues of HRD.

## Training

Training concerns people already employed with the organization and whose jobs are so defined that we are able to identify what should be the desired job behaviours. The focus on training programmes should be such, so as to enable the individual to perform more effectively in his present job position. Training is needed when a person is hired without the requisite skills, attitude or knowledge or may be when after putting the person on the job, the management able to identify his deficiencies that could be rectified through training. Even in cases, where an employee may be performing very well, change in procedures, materials, processes may stimulate the need for further training. Concepts like total quality management (TQM), small group activities (SGA) or quality circles (QC) are now calling for new areas of training for employees to make them functionally more effective in their restructured jobs. We have discussed these issues in a separate supplementary note. For effective results, the responsibility for training should be on the immediate supervisor of the trainee. As the pay-off of the training is verified on the job, the supervisor is expected to see the results and, therefore, he is the right person to allocate physical and financial resources to improve his human resources. However, in most of the organizations, supervisors are made responsible for identification of training needs and their role is restricted to impart technical skills. For conceptual and human skills, training is given by a specialized group of trainers. Training can either be conducted through in-house programmes or by retaining professional trainers/consultants.

The evaluation of training is done in direct relation to the job. At the end of the training, it is expected that there should be some identifiable changes in job behaviour. Where no such changes in job behaviour could be identified, we

expect there may be one or more of the following problems—ineffective training programme, lack of linkage between the training programme and the job or negative reinforcements in the work situation. Evaluation of training is easy because of its job relatedness.

## Education

Educational experiences benefit those who are employed and who are required to be gradually equipped for other positions in the organization. Thus, educational component of HRD is future oriented for identifiable job positions. Since, the return on investment from education is unclear or unascertainable, very few organizations are prepared to invest on employee educational programmes unless future needs or manpower plan of the organization substantiates the possibility of redeployment of employees after the completion of education programme.

Many organizations allow their employees to go on study leave for pursuing institutional studies on areas like, Management, Accounting and Finance, Quality, Engineering or even for Research, which have relevance to the organizational needs. Employees are allowed to draw their pay and get reimbursement of actual cost for study during this period, and such leave is not debited against employees' leave account.

Some organizations encourage their employees to get enrolled in part-time evening programmes and allow them reimbursement of actual cost. In India, nowadays a number of institutes encourage sponsored candidates to pursue studies as full time students.

However, education within the organization is considered as a better alternative as it simultaneously ensures employees' on-the-job activities and learning of new techniques for their future roles. To take an example, some organizations with their in-house talents run professional programmes for their employees like, engineering degree courses of Institute of Engineers, Indian Institute of Metals, management degree courses of All India Management Association, National Institute of Personnel Management, ICFAI Business School, International Institute of Management Science, professional programmes of Indian Society for Training and Development, National HRD Network, Academy of HRD, etc. This is considered more cost effective than the earlier two methods, and this also reduces the time-lag between the time of educational experience and its application on the new job. Many international organizations has also recently started their own corporate universities to periodically educate their employees, viz., Sears, Lucent, Motorola, McDonalds, etc. These organizations systematically depute their employees to go for long-term educational programmes to renew their knowledge base.

Employee education calls for attitudinal changes of corporate leaders as they should be prepared at the outset to invest in the future of individuals who may or may not remain with the organization. It is also necessary to identify individuals who are future oriented. Evaluation of employee education is difficult when there is considerable time-lag between learning and its actual on-the-job application.

## Development

Development component of HRD is to conduct learning experiences for a future undefined job. The focus being on future undefined job in an organization, before going ahead with employee development, organization must be able to identify

individuals who enjoy high risk and new undefined challenging jobs. Such risk takers may not necessarily confine in higher levels of an organization, even though conventionally, developmental function rests in the higher levels only. Since, decisions on investment in employee development are taken at higher levels and people at higher levels are considered to be more knowledgeable (both by virtue of experience and educational background) than people at lower levels, hardly a few organizations consider it right for risking the investment to develop employees at lower level. However, experience shows, carefully planned developmental experiences can be helpful in realizing the human potentials, irrespective of their hierarchical levels and functional areas.

Before the introduction of computers in Indian organizations, computer literacy was considered as a developmental function. At present, however, TQM, Business Process Re-engineering, Benchmarking, ISO:9000 Quality Systems, Value Engineering, Knowledge Management, Customer Relationship Management, etc., are considered as new areas of development.

Valuation of employee development programmes is extremely difficult both in terms of return on investment and application of learned experiences, for obvious time-lag, in the organization.

However, success of training, i.e., HRD efforts of an organization in the form of education and developmental programmes, largely depends on simultaneous changes in the organization, which is known as organizational development (OD). Changes in the employee behaviour for training, education and development programmes are reinforced by changes in the organization by OD process, which uses many strategies and interventions. Hence, HRD efforts should be in congruence with OD investments.

### Objectives of HRD

From the foregoing discussion, objectives of HRD can be listed as follows:

1. To develop capabilities of all individuals working in an organization in relation to their present role
2. To develop capabilities of all such individuals in relation to their future role
3. To develop better interpersonal and employer-employee relationships in an organization
4. To develop team spirit
5. To develop coordination among different units of an organization
6. To develop organizational health by continuous renewal of individual capabilities (averting manpower obsolescence), keeping pace with the technological changes

Objectives of HRD can be made clear when we highlight the importance of human resources in line with the examination process of the 'Baldrige Award' which is given at an international level to a quality organization. Objectives of HRD practices in an organization should be to put efforts to develop/and realize

the full potential of the workforce, including the management. They also help in maintaining an environment conducive to total participation, quality leadership and personal and organizational growth. In an organization, there are six units, which are concerned with HRD namely person, role, dyad, team, inter-team and organization. The effectiveness of one contributes in turn to the effectiveness of the others.

HRD objectives can also be couched in line with W. Edward Deming's fourteen principles for quality improvement in an organization. Here, we would not discuss the fourteen principles but we will focus on only those points which are related to HRD objectives. They are as follows:

1. Institute training on the job
2. Breakdown barriers between departments to build teamwork
3. Drive fear out of the work place
4. Create conditions to enable employees to take pride in their workmanship
5. Institute programme of education and self-improvement

For better appreciation, we will review the HRD objectives of two leading companies in India.

#### Exhibit 1

### HRD OBJECTIVES OF SIEMENS LIMITED

- Development of employees is the primary task of the company
- It is the policy of Siemens to recruit, train, develop and advance employees within the company

To achieve these objectives, Siemens have laid down their policies as under:

- Recruitment of quality manpower and their retention
- Recruitment mainly at entry level
- Plan and monitor career development staff to perform effectively in their present jobs; groom potential managers for higher responsibilities
- To introduce and sustain an objective system of evaluation of performance based on result
- Performance as the sole criterion for increments and promotion
- Use of training as the strategic factor for competitive advantage
- To nurture a spirit of entrepreneurship among employees
- Work in close collaboration for fostering the spirit of openness
- To ensure transparency in decision making.
  - Self-motivated employees
  - Employee commitment
  - Commitment of results

**Exhibit 2****HRD OBJECTIVES OF W.S. INDUSTRIES INDIA LIMITED**

- To plan and induct appropriate manpower in terms of knowledge, skill and attitude
- To provide opportunities for growth to employee in terms of remuneration, career and skill endowment
- To practice equity and fairness in all its dealings with employees
- To continuously enhance knowledge, skill of employees for the performance of their present and future task through education and training
- To create an organizational climate to have a highly motivated work force
- To prepare employees for easy and faster adaptation to change

**Role and Significance of HRD**

For any dynamic and growth-oriented organization to survive in a fast-changing environment, HRD activities play a very crucial role. Recent economic restructuring in India at macro level influenced the need for production at unit (micro) level, and this production restructuring necessitated labour restructuring vis-à-vis restructuring of HRD activities at organizations. Training, retraining and redeployment has now become a buzzword in the corporate circle as market globalization (an outcome of economic restructuring programme), delicensing and free flow of technology (as per New Industrial Policy of July, 1991) intensified competition, rendering traditional skills and knowledge redundant. Many organizations in India are now threatened with manpower obsolescence to withstand for which HRD activities have now received prime importance.

Increased morale and motivation of employees no doubt are necessary to achieve productivity and functional effectiveness. However, these alone cannot sustain a dynamic organization, unless effort and competencies of human resources are renewed constantly in developing and enabling the organizational culture. An enabling organizational culture is possible when employees of an organization are found to use their initiative, take risks, experiment, innovate and make things happen.

Hence, role and significance of HRD in an organization can be appreciated when we consider the fast changing environment coupled with technological change and intensified competition. This has necessitated the need for renewal of capabilities of people working in the organization, which are simultaneously reinforced by changes in the organization by OD process.

The role and significance of HRD can further be appreciated when we consider different sub-systems of HRD like, Performance Appraisal, Career Planning and Development, Manpower Planning, Management Succession and Development

Training (which includes the role of education and development discussed earlier), Organizational Development, Quality of Work Life (QWL), etc. Discussions of all such sub-systems have been done separately in the book.

**Management of HRD Unit**

In the foregoing paragraphs, we have mentioned different sub-systems of HRD. In this paragraph, we will consider the functioning of integrated HRD systems in an organization. It is pertinent to mention that India organizations, by and large, have personnel functions integrated with HRD functions, with an exception of a few who have separate HRD department, exclusively for HRD functions. Most of the organizations, therefore, merely retitled the designation of their core personnel people by either calling Human Resource Manager or Human Resource Development Manager. Yet, there are some organizations who have isolated their HRD as training function, entrusting the responsibility to Management Development Officers or Principals of their Management Development Centres. Public sector giants like Steel Authority of India Ltd (SAIL), Indian Oil Corporation (IOC), National Thermal Power Corporation (NTPC), Oil and Natural Gas Corporation (ONGC), Coal India, have set up their own management development institutions/centres. Developmental undertakings like Indian Ordinance Factories, Indian Railways also have their separate management development centres. Many commercial banks like, Reserve Bank of India, Regional Rural Banks, Industrial Financial Corporation of India (IFCI), Industrial Credit and Investment Corporation of India (ICICI) and insurance companies like, Life Insurance Corporation of India (LIC), General Insurance Corporation of India, have set up their own staff training colleges for developing their human resources. Similarly, private companies like, Tata Iron and Steel Company (TISCO), Kirloskar Group, Reliance, Lakshmi Group, Hinduja Group, Modern Group, Lalbhai Group have their own management development centres to develop and train their human resources.

**Focus of the HRD System**

Reviewing the definition, role, significance, purpose and objectives of HRD as explained in the foregoing chapters, it is evident that HRD department of an organization focuses on the following important areas:

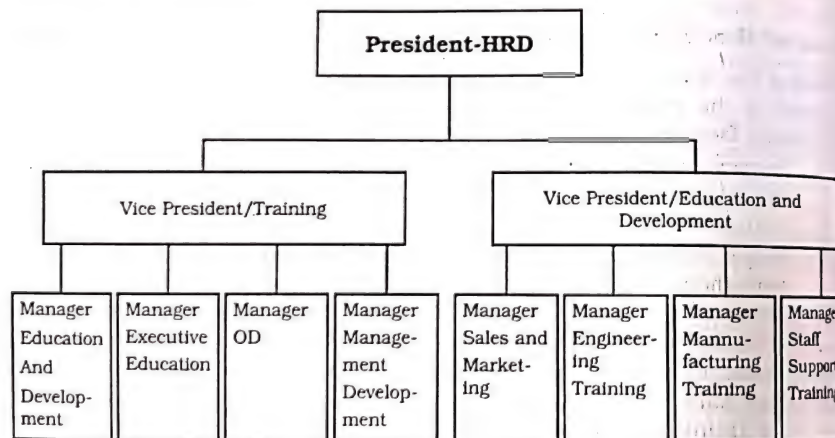
1. *Increasing the 'enabling' capabilities* by developing human resources, organizational health, team spirit and increasing employment motivation and productivity.
2. *Focus on balanced organizational culture* by conducting periodic surveys, workshops, discussions stimulating openness, mutual trust, team spirit, creativity, initiative, mutuality, collaboration, delegation, autonomy, respect, management of mistake, management of conflict, etc.
3. *Focus on learning contextual factors* from different professional bodies like, National Institute of Personnel Management (NIPM), Indian Society for Training and Development (ISTD), National HRD Network (NHRDN), All India Management Association (AIMA), etc. These professional bodies, through their publications, seminars and workshops, share the experiences of the corporate world.

4. Focus on periodic reviewing of HRD system, which may call for redesigning Performance Appraisal, Job Rotation, Reward Systems, Career Planning, Promotion, Selection, Induction, Training and Development Programme, etc.
5. Focus on integrating HRD with other corporate functions like, Production, Marketing, Finance, Material, Corporate Planning, etc. Such integration will strengthen the development of 'enabling' organization.
6. Focus on diffusion of HRD function involving line managers in various HRD aspects like Training of Subordinates, Performance Appraisal, Promotion, Placement, Selection, Career Planning, etc. Line people by virtue of their rich experience may effectively contribute to these HRD developing an integrated HRD system in an organization.
7. Focus on working with unions by taking them into confidence and collaborating with them. Unions can also play a positive role in furthering the organization is evident from number of examples like, Syndicate Bank Employees Union very recently collaborated with the management to reduce the Non-performing Assets (i.e., bad debt realization).

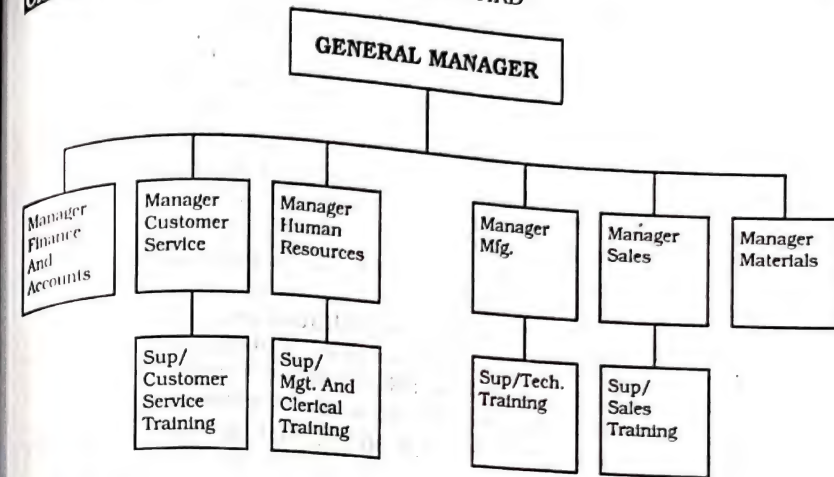
### Structure of HRD System

The precise organizational plan for an HRD department depends on the type and of the organization in which it is located. Here, we are giving hypothetical examples of organizational structure of three different organizations to appreciate the functioning of HRD departments in different organizations.

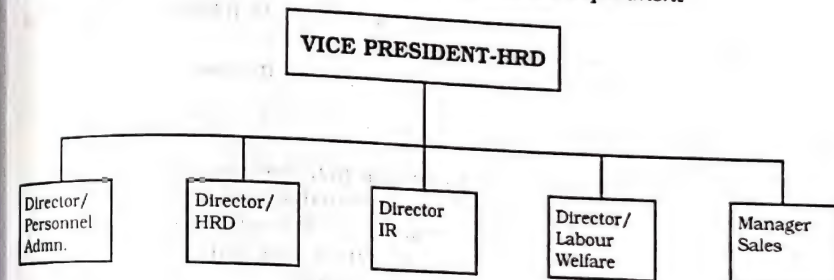
**Chart 1** Organizational Chart for a Large Company



**Chart 2** Organizational Chart for Integrated HRD



**Chart 3** Organizational Chart for HRD as a Separate Department



Structure of HRD system in organizations was briefly discussed in the introductory part of this chapter, duly illustrating an integrated HRD structure and HRD as a separate functional identity in an organization. Here we will discuss the basic principles while structuring HRD Department of an organization.

Needless to mention that the structure of HRD Department differs from organization to organization, for the differences in size, nature of activity, philosophy and attitude. However, following principles are usually followed in every organization, while it goes for structuring the HRD Department.

1. Developing an identity of HRD, which may or may not encompass other personnel functions
2. Establishing credibility for the HRD function, which is possible by entrusting the responsibility for HRD at a higher level in an organizational hierarchy
3. Balancing Integration and differentiation. Differentiation can be ensured by not diluting the HRD functions with traditional personnel management and industrial relations function, which is possible by entrusting the

functional responsibilities to different department heads as illustrated in Chart 3. Similarly, integration can be achieved by diffusion of HRD functions with other major corporate functions like, marketing, production (as explained earlier) and line functions, as inputs from these areas can enrich the functioning of HRD department, structure of which has been illustrated in Chart 2

4. Likewise, while structuring an HRD Department of an organization, it should be ensured that it has linkages with external systems and internal systems, i.e., HRD Department should represent various task groups, ad hoc committees, etc.
5. Finally, structure of HRD Department should be developed so that it can sustain a monitoring mechanism

Basic principles governing the functioning of HRD system in an organization have been made clear by the American Society for Training and Development (ASTD), while describing different roles of HRD Managers. However, basic essence of functioning principles of HRD systems can be listed as follows:

- (a) HRD systems should develop a strong feedback and reinforcing mechanism.
- (b) The system should balance qualitative (subjective) and quantitative (objective) decisions.
- (c) The system should balance the requirement of internal and external expertise.
- (d) The system should be introduced in a phased manner.

### Role of HRD Manager

From the foregoing discussions, it is apparent that the primary goal of HRD is to increase worker's productivity and firm's profitability as investment in HRD improves worker's skill and enhance motivation. The other goal of HRD is to prevent obsolescence at all levels. To achieve these two goals, HRD Manager of any organization plays following two important roles:

1. To assist people in obtaining the knowledge and skills they need for present and future jobs and to assist them in attaining their personal goals.
2. To play the 'enabling' role, providing the right context in which human performance occurs and the organization reaches its stated objectives.

In 1998, ASTD identified eleven roles of HRD manager, which can be enumerated as follows:

1. **Administrator:** The role of providing coordination and support services for the delivery of HRD programmes and services.
2. **Evaluator:** The role of identifying the impact of an intervention on individual or organizational effectiveness.
3. **Individual Career Development Advisor:** The role of helping individuals to assess personal competencies, values and goals and to identify, plan and implement development and career actions.
4. **HRD Manager:** The role of supporting and leading a group's work and linking that work with total organization.

5. **Instructor/Facilitator:** The role of presenting information, directing structured learning experiences and managing group discussions and group process.
6. **Marketer:** The role of marketing and contracting from HRD's viewpoints, programmes and services.
7. **Material Developer:** The role of producing written and/or electronically mediated instructional materials.
8. **Needs Analyst:** The role of identifying ideal and actual performance and performance conditions and determining causes of discrepancies.
9. **Organizational Change:** The role of influencing and supporting changes in organizational behaviour.
10. **Programme Designer:** The role of preparing objectives, defining content and selecting and sequencing activities for a specific intervention.
11. **Researcher:** The role of identifying, developing or testing new information (theory, concepts, technology, models, hardware) and translating these two implications for improved individual or organizational performance.

R. Wayne Pace, Philip C. Smith and Gordon Mills (1991) after reviewing the eleven roles of HRD, as indicated by ASTD, grouped all these roles into four major areas as below:

#### Analytic role:

- (a) Needs Analyst
- (b) Researcher
- (c) Evaluator

#### Developmental role:

- (a) Programme Designer
- (b) Materials Developer

#### Instrumental role:

- (a) Instructor/Facilitator
- (b) Organization Change Agent
- (c) Marketer

#### Mediational role:

- (a) HRD Manager
- (b) Individual Career Development Advisor
- (c) Administrator

### Role of Consultants in HRD

In HRD, consultants play a very crucial role, particularly in following areas:

- (a) In designing a career plan for the employees, many organizations prefer to retain the services of consultants. Career planning is a very complicated function of the organization because faulty career planning may ultimately lead to dissatisfaction of the employees, who may leave the present organization to get employed elsewhere. Many Indian organizations face the crisis of mid-career shift for not adopting the suitable career plan for their employees. The Steel Authority of India Limited (SAIL), the public-sector steel giant very recently lost 400 of their key and middle-

level executives who left to join newly formed private steel-manufacturing companies. The chairman of SAIL in a recent press briefing lamented such large scale exodus of steel executives from SAIL would cost heavily for the organization, as in developing an executive with exposure in steel requires a time of ten to fifteen years. All such executives who have left SAIL attributed reasons which, *inter alia*, include absence of better career progression in SAIL and more financial benefits in private steel-manufacturing companies. Banks and other financial institutions are also facing similar unpleasant situation for recent liberalization of financial market vis-à-vis the emergence of private banks/foreign banks/global financial institutions, etc. Very recently, State Bank of India retained the services of world famous management consultant, McKinsey for restructuring the organization, which among other things includes developing suitable career plans for their employees.

- (b) Manpower Planning has also become a crucial function for HRD consultants, especially in the wake of increasing manpower obsolescence for technological changes in Indian industries.
- (c) Similarly, in Training and Development, Performance Appraisal, Recruitment, Selection and Placement, Developing Suitable Promotional Policies, Management Succession and Management Development, etc., HRD consultants play a very crucial role.

Before engaging HRD consultants, it is necessary to consider following important points:

- (i) When an organization needs to expand its capabilities on 'Crash Basis', i.e., on emergent basis with the sense of urgency, then under these circumstances the organization cannot afford to rely solely on untried competence of this internal resource alone. It needs to hire the services of consultants, who are having the required expertise.
- (ii) Similarly, an organization may require to avail the services of specialized experts in some areas, where it does not have the requisite internal skill and knowledge. This is particularly relevant in cases like training and management development programmes where we find many organizations retaining the consultants to impart training on TQM, ISO:9000, Quality Circles, Value Engineering, Business Process Reengineering (BPR), Benchmarking, Just-in-Time (JIT), Total Productive Maintenance, etc.
- (iii) HRD consultants are also engaged in cases where objectivity or corporate strategy leverage to a job done needs to be given.

Whatever may be reasons for retaining the services of HRD consultants, we find their increasing use in corporate sector for efficient result, cost benefit, less time lag, etc.

### Line Managers and HRD

Udai Pareek and T. V. Rao (1991) also emphasized the role of line managers in realizing the HRD objective of an organization. Since, line managers translate the objectives in to action, they are responsible to develop and utilize the manpower. In all the components of HRD, i.e., Career Planning, Training, Performance Appraisal and Organization Development, line managers have certain specific responsibilities which precede development of certain congenial conditions for employees. Line

managers need to ensure that they create such conditions in the workplace which enable employees to:

- (a) Acquire and develop new capabilities
- (b) Perceive possible outcome of acquiring such new capabilities
- (c) Assess the self growth
- (d) Enjoy the growth process

Since line managers are in close proximity with the operation people, it is their responsibility to create and develop such conditions in the organization, which can then reinforce the HRD objectives of the organization as a whole. Creating the above conditions in workplace is a precondition in realizing the HRD objectives by line managers, which, *inter alia*, also require them to play a proactive role in following areas:

1. Line managers need to define the capabilities of employees. By developing such capability profile of employees, they can facilitate skill and competency mapping for other strategic decisions of the organization like HRP, etc. This input also helps an organization to identify shortage in critical skill areas, and accordingly, the organization can initiate required action plan through training and development programmes. Apart from above strategic functions, this also helps in developing skill inventory, deciding about redundancy, transfer, promotion, relocation, restructuring, redeployment, etc.
2. Line managers help in identification of training needs. Due to the reason of their close proximity to the operational people, they observe and understand the performance of employees better. This requirement has now become important even for the documentation of quality standards, i.e., ISO:9000. All the ISO-certified organizations have documented systems in this respect.
3. Line managers also play other developmental roles to motivate people to learn and take responsibility by continuous coaching and developing problem-solving skills, by recommending them for further training, etc. They encourage employees to promote small group activities like Quality Circles, TQM Club, Value Engineering Team, etc. Many organizations prefer to involve line managers in in-house training programmes, rather than outsourcing training experts.
4. Line managers also play an important role in identification and clarification of Key Result Areas (KRAs) or Key Performance Areas (KPA's). Setting KRAs/KPA's alone cannot set the ball rolling. It requires continuous support and sustenance of an environment of mutual trust and openness. Line managers, by extending their help and support, enable the subordinates to realize their goals. This inculcates a sense of achievement, which has tremendous motivational benefit.
5. In OD Intervention, line managers play the important role by identifying the required initiative, by participating in organizational diagnosis surveys and finally by implementing the suggestive action plan.
6. Line managers also reinforce teamwork and collaboration, suggest reward for good performance and foster total participation culture by involving subordinates in decision-making process. These together reinforce HRD climate in an organization.

7. Finally, in career planning and development, line managers play the crucial role in identifying career opportunities and encouraging subordinates to develop required potential to grab such opportunities.

Internationally, it is now being debated whether HRM or HRD should continue as a separate support function or integrated with line functions. Since, organizational structure is also getting changed (from traditional functional system to strategic or independent business units), it is almost likely to get cognizance. HR as a core management knowledge is already recognized in many countries. However, for Indian organizations, this requires a major attitudinal change. Even the threat is also from the HR profession itself, as it may culminate to an identity crisis, obviously for not being able to keep pace with the requirements of the changing time.

### HRD Culture

HRD facilitates development of an enabling culture in an organization. In a changing environment, organizations are required to go for frequent restructuring and redesigning of activities. Without an enabling culture, it is difficult for the organization to withstand the change requirements. Enabling culture creates an environment where employees are motivated to take initiative and risk, they feel enthused to experiment and innovate and they make things happen. Thus HRD culture, which develops an enabling culture in an organization, is characterized by following practices:

- Openness
- Confrontation
- Trust
- Autonomy
- Proactiveness
- Authenticity
- Collaboration

### HRD Climate

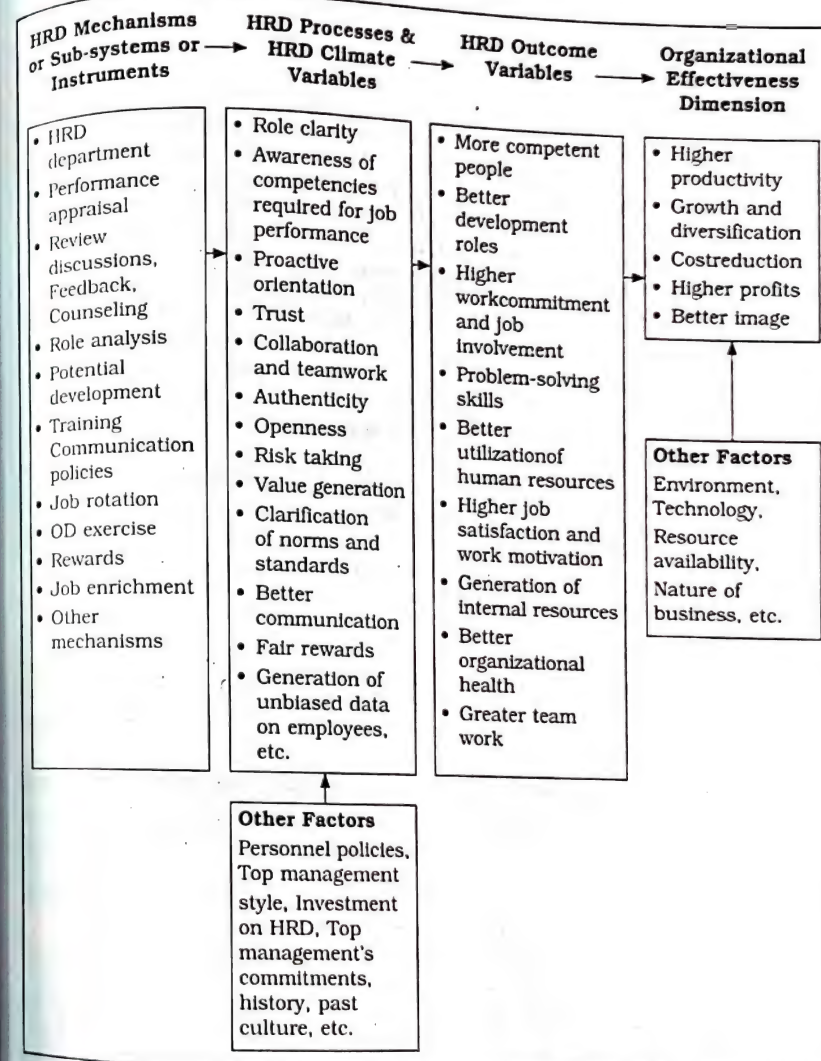
HRD climate is the perception of the employees about the prevailing HRD culture in the organization. To understand the HRD climate, organizations often institute a survey with a structured questionnaire. Analysing the survey response, it is possible to map the HRD climate covering all the enabling practices mentioned earlier. Necessary remedial action, if any, can be initiated by the organization to address the gap. Some of the elements of the questionnaire can be listed as follows:

- (a) Does the organization consider employees as the most important resource?
- (b) Does the organization believe in developing competencies of all cross-section of employees and initiate action in that direction?
- (c) To what extent is the organization transparent in communication?
- (d) Are the employees encouraged to take risks?
- (e) Is there a climate of collaboration, team spirit, mutual trust and confidence?

- (f) Are the personnel policies supportive in nature?
- (g) To what extent HRD activities are development oriented?

### HRD Matrix

HRD Matrix is the interrelationship between HRD practices and organizational effectiveness. HRD practices generate HRD processes, which result into HRD outcomes that contribute to organizational effectiveness. T.V. Rao in *Readings in HRD* (1990) developed such matrix, which is presented below:



## SUMMARY

HRM, per se, cannot be understood without appreciating its process of development, suitably delineating it from the traditional labour welfare and personnel management concepts. There is still a debate on the suitable title for the profession. It is generally left to the organizations to name it by whatever name they call. Whether it is utilization or development, strategy or operation, HRM and HRD can really not be separated as one reinforces the other. HRD, OD and IR are the separate aspects of a broader concept of HRM. Thus, without successful HRM, organizations cannot remain competitive.

## Key Words

**Personnel Management:** Basically managing people with a structured approach. In its refined form, today it is known as human resource management.

**Serfdom:** Serfdom is based on a positive incentive system, just opposite to slavery. It is the beginning of human resource management.

**HRM:** Human Resource Management.

**Guild System:** The guild system involving master craftsman (the owner), the journeyman (the traveling workers) and the apprentice together developed the human resource management practices involving selection, training and development of workers and also the emergence of collective bargaining over wages and working conditions.

**HRD:** Human Resource Development.

**Downsizing/Rightsizing:** Optimization of manpower.

**VRS:** Voluntary Retirement Systems.

**Competitive Advantage:** Those factors which give edge over other competitors and which cannot be duplicated or replicated.

**TQM:** Total Quality Management.

**Small Group Activities:** Quality Circles, TQM Team, Value Engineering Team, etc., where all workers can participate to share their views on work-related issues.

**T-Groups:** Training Groups

**Quality Circles:** A type of small group activities, which enables workers' participation to identify and to suggest remedial actions for the same.

## REVIEW QUESTIONS

1. Briefly discuss the history of development of HRD function? Or discuss the process of development of HRD suitably delineating it from labour welfare and personnel management?
2. What are the general functional areas of HRD? Answer this question keeping in view the HRD functions of any organization.
3. Do you think HRM and HRD are different functions? How did the concept of HRD develop in an organization?
4. Differentiate between training, education and development. Discuss how they are related to HRD.
5. What are the objectives of HRD functions? Briefly explain the HRD objectives of any leading organization.

6. Explain the role and significance of HRD. Do you think, in the present context in India, we really need HRD professionals in our organizations?
7. Organizations impart education to their employees for grooming them for unidentified future positions. This is because today's organizations are environment sensitive. Elucidate this statement.
8. What should be your focus areas for designing an effective HRD system? Which area would you consider more important than others?
9. What important factors should be considered while structuring HRD unit of an organization? Illustrate your answer with an organization chart of HRD department of any organization.
10. Briefly discuss the principles for functioning of HRD system of an organization. What are the important roles of an HRD manager?
11. Do you think for an organization it is necessary to retain an HRD consultant? What are the possible advantages and disadvantages in retaining HRD consultants?
12. Short Notes:
  - (a) Guild System
  - (b) Structural Change in Employment
  - (c) Kurt Lewin
  - (d) T-Groups
  - (e) Competitive Advantage
  - (f) Human Resource Utilization (HRU)
  - (g) Integrated HRD Functions
  - (h) Enabling Organization
  - (i) Analytic Role of HRD Manager
  - (j) Instrumental Role of HRD Manager

## REFERENCES

1. Beer, M., B. Spector, P. R. Lawrence, D. Quinn, Mills, and R. Walton. 1984. *Managing Human Assets*. New York: Free Press.
2. Bhattacharyya, Dipak Kumar. 2006. *Human Resource Management*, 2nd edition. New Delhi: Excel Books.
3. Bhattacharyya, Dipak Kumar. 2006. *Human Resource Planning*, 2nd edition. New Delhi: Excel Books.
4. Bhattacharyya, Dipak Kumar. 2007. *Human Resource Research Methods*. New Delhi: Oxford University Press.
5. Bhattacharyya, Dipak Kumar. 2009. *Organizational Behaviour—Concepts and Applications*. New Delhi: Oxford University Press.
6. Kanter, R.M. 1989. *When Giants Learn to Dance*. New York: Simon and Schuster.
7. Nadler, Leonard, and Zeace Nadler. 1989. *Developing Human Resources*, San Francisco: Jossey-Bass Publishers.
8. N. M. Trichy, C. J. Fombrun, and M.A. Devana. 1984. *Strategic Human Resource Management*. New York: Wiley.
9. Pace, R. Wayne, Phillip C. Smith, and Gordon E. Mills. 1991. *Human Resource Development: The Field*. New York: Prentice Hall College Div.
10. Pareek, Udal, and T. V. Rao. 1991. *Designing & Managing Human Resource Systems*. New Delhi: Oxford & IBH.
11. Peters, Thomas J., and Waterman, Robert H. 1982. *In Search of Excellence: Lessons from America's Best-Run Companies*. New York: HarperCollins Publishers.
12. Skinner, B. F. 1981. 'Selection by Consequences'. *Science* 213: 501-14.

# Organizational Behaviour and Employee Perception

## LEARNING OBJECTIVES

*After going through this chapter, a student would be able to*

- comprehend the meaning and significance of organizational behaviour
- know definitions and concepts of perception
- understand the processes and sub-processes of perception
- be familiar with individual decision-making styles
- appreciate scenario planning for individual decision

## INTRODUCTION

Organizational behaviour is the analysis of an organization's structure, functions and the behaviour of its people. Behavioural study encompasses both groups, as well as, individuals. It is an interdisciplinary field and has its roots in sociology and psychology. Organizational behaviour is based on sociology, as the word 'organization' itself represents social collectiveness. It is linked to psychology because the subject encompasses the study of people, individually and in groups at the workplace (essentially, an organization). Individual and group behaviour is again the function of many factors, which extend to other interdisciplinary fields such as economics, political science, social anthropology, engineering, and human resource management. The scope of organizational behaviour is, therefore, extensive. An organization needs to manage all these aspects so that it can sustain itself in a competitive market.

Theoretically, it is difficult for us to draw a line between management and organizational behaviour. It can be said that one supplements the other. Some organizational behaviour issues have their roots in the management processes. In fact, the study of management began much before the study of organizational behaviour. Studies in organizational behaviour started in the middle of the twentieth century. Organizational behaviour

studies, therefore, draw from management theories to understand aspects such as organizational structure, behaviour of its people and the issues concerning external and internal fit.

Successful management of organizational behaviour largely depends on the management practices that prevail in an organization. Understanding organizational behaviour, therefore, requires a clear understanding of the basics of management.

Going back in history, we find that before the industrial revolution (which took place in Europe in the middle of the 18th century), people used to manage their own economic activity through home-centred production systems. They were themselves, the owners of labour, services and capital. Since participation was spontaneous (as it was their own work) and the size of activities was small (confined to the family members), management as a significant human activity did not get much recognition in those days. With the advancement of technology, communication, and transportation, the domain of the market expanded beyond the neighbourhood areas. It was at this point of time that organized production activity in the form of factory-centred production systems began to emerge. People started working in groups to accomplish common goals. It was not possible, for individuals or individual households to achieve these goals. An understanding of management and organizational behaviour then became crucial for coordinating the efforts of individuals working in groups.

To understand organizational behaviour, it is essential at the outset to understand the individual behaviour. Nature and personality of individual human being is the root cause of behaviour. Work-related behaviour of people in an organization stems from both environmental and individual factors. Human behaviour is broadly classified into two characteristics—*inherited characteristics* and *learned characteristics*. *Inherited characteristics* usually do not get influenced by external forces. *Learned characteristics*, on the contrary, also result in permanent change in behaviour. Learning is the result from interactions with the environment. It involves an individual's attitudes, values and perceptions and the environment around him. Perception is a process of receiving, selecting, organizing, interpreting, checking and reacting to sensory stimuli. To be more simplistic, through perception we process information and then interpret to deduce a sensible meaning. Attitude, on the other hand, is a perception with a frame of reference. It is a stable way of thinking, perceiving and acting towards a situation or object. Personality is the set of traits and characteristics, which forms the habit strength and a static response pattern to a certain stimuli. Values are basic convictions which depict an individual's moral structure. It helps to determine what is right and what is wrong.

Perception is more considered as a sensory stimulus. Through perception, we deduce some sensible meaning of a situation or information. Thus, perception receives, selects, organizes, interprets, checks and reacts to any stimulus. We at the individual level, through a dynamic inner process, develop our response to the outside environment. Our response is largely influenced by the perception. In managing the organizational behaviour, we need to study the difference between the perceptual and the real world. Moreover, work-related behaviour of an individual is the product of perception. Today's managers, therefore, need to understand their own perceptions, as well as, the perceptions of the subordinates.

Perception is a process by which we organize and interpret our sensory impressions in order to give meaning to their environment. However, what we perceive can be different from the objective. For organization to drive people to achieve a common goal, it is important that all cross-sections of employees perceive the same with reference to organizational goals and objectives; else it would be difficult to achieve the results. We have already been introduced to the concept of shared vision under McKinsey's 7-S framework. Such shared vision would be truly possible, when all employees put their efforts in the same direction, to achieve the goals. Any perceptual difference may hinder such achievement. As perception influences the behaviour of people and so also their style of decision making, it is very important for the organizational behaviour. Some of the characteristics of perception are:

- Perception may be different from the objective reality, i.e., what one perceives may be different from what the object or target or the situation actually is.
- There may be disagreement among individuals to perceive the same object or target or the situation. Company policies on wages and salaries, incentives, promotion and transfer may be perceived by different employees differently, as employees perceive the situation with their own frame of reference.
- Similarly, perception of employees towards the same manager may be different.

Shaping perception of employees of the organization to develop their shared vision is the greatest challenge for any organization, as this helps in achieving the results.

### PERCEPTION AS A PROCESS

Perception is a three phase process of selecting, organizing and interpreting information. As a process, we use perception to interpret and organize sensations to draw a meaningful experience of the world around us. Here we can draw a borderline between the sensation and the perception. *Sensation* is the unprocessed result of stimulation of sensory receptors in the eyes, ears, nose, tongue, or skin, whereas, *perception* describes our ultimate experience of the world processing our sensory inputs. Thus, we can hardly separate perception and sensation, as they are intertwined. Therefore, as a process, perception translates our sensory impression, guides our behaviour and encompasses all processes that associate with the recognition, transformation and organization of sensory information. From that perspective, we can also relate perception to cognitive functions like, reasoning, concept formation, problem solving and memory and also consider it as a sensory motor behaviour. Perception is also known as perceptual process, which is viewed as a complicated interaction of selection, organization and integration, through the process of addition and subtraction from the real sensory world.

There are two distinctly different approaches to perception. E.J. Gibson (1969) argued that perception is the outcome of stimulus. Nature of stimulus is primarily responsible for what and how we perceive. Constructivist theories, on the other hand, argue perception is influenced by your experience and expectations. Theories of attitudinal change and social learning also support the second argument.

The diagram below is a conceptual schematic of the process of immediate perception.

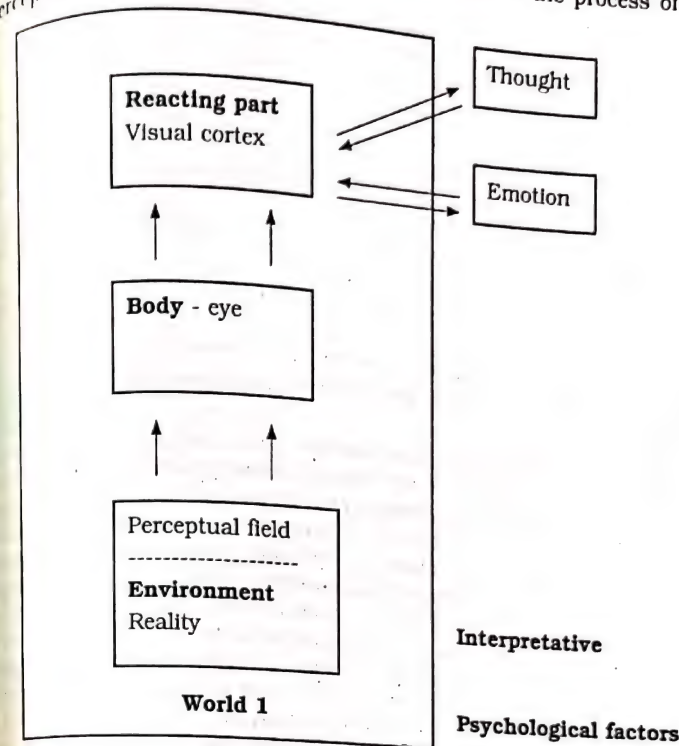


Figure 11.1: Process of Immediate Perception

### Sub-Process of Perception

Sub-processes of perception are many, and they vary from individual to individual. Broadly we can categorize perception into:

- Internal Causation
- External Environment
- Sensual Stimulation
- Physical Environment
- Socio-Cultural Environment

Internal causation and external environment have already been explained earlier. *Sensual stimulation* could be generated by the supervisors, new procedures of the organization, new machineries, etc. We first register all these cues through our sensory and neural mechanisms. We then interpret the stimulus through our motivation, learning and personality; we behave overtly or covertly; we get the feedback on our behaviour and then face the consequences. *Physical environment* could be the office, shop floor, research labs, store and climate. *Socio-cultural environment* is the management styles, values and discrimination.

## Factors Influencing the Perception

What influences the perception of people is again difficult for us to categorize. An individual perceiver attaches meaning to an object or target, a situation with his/her frame of reference. Hence we can say, perception depends on the personal characteristics of the individual perceiver. Such personal characteristics can be the aggregation of attitudes, personality, motives, interests and so also the past experiences. Again the characteristics of the object or target and so also the situation can affect the perception. Finally, the context in which the object or target and the situation are being perceived is also important.

Based on the above, we can broadly categorize perception into the three areas as under:

1. Attitude, personality, values, motive, interests, experience and expectations of the perceiver.
2. Time, work situation and social setting of the situation.
3. Shape, size, shape, sound, movement, background and profile of the object or the target.

Perceiver is the individual who perceives the object, target or the situation. Attitude develops a frame of reference, which helps the individual to perceive. Thus, attitude is a stable way of thinking, perceiving and acting towards a situation or object. Personality is the set of traits and characteristics, which forms the habit strength and a static response pattern to a certain stimuli. Values are basic convictions which depict an individual's moral structure. It helps to determine what is right and what is wrong. Motives are unsatisfied needs, which exert influence on perception. Interest is the likings and disliking of the people. Past experience narrows down the perception, i.e., it nullifies the interest on objects or targets or situation. In contrast, however, objects, targets and situation which have not been experienced earlier, evoke more interests. Finally, from the perceiver's point of view, expectations also distort perception, when the gap between what we see and what we expect widens.

Individual's perception is often situation specific. Time, work and social settings are the three constructs of a situation. A boss in office is perceived differently by his/her subordinates. However, the same boss when becomes informal with all his/her subordinates in a party, is perceived differently.

Similarly, objects or targets in relation to its shape, size, shade, sound, silhouette, movement and background influence one's perception. A police officer in uniform may be perceived as ruthless and tough, while in the core of his/her heart, she/he may be soft and delicate.

## Theories of Perception

Here we are explaining some of the important theories of perception. Some of the important theories are: attribution theory, selective perception, halo effect, contrast effect, projection, stereotyping, etc.

*Attribution theory* explains that people develop explanations attributing a meaning to a given behaviour. It is our general propensity to develop on our own some explanations about the behaviour of others. In the process of developing our own explanations, we also try to attribute whether such behaviour is the

outcome of internal or external causes, based on our perceived mapping of degree of distinctiveness, consensus and consistency.

*Internally caused behaviour* is considered to be under the personal control of the person who behaves. *Externally caused behaviour*, on the other hand, is considered as the results of outside causes beyond the control of the individual. A habitual latecomer's late attendance is considered as an internal issue, while an occasional latecomer's late attendance is considered as an external issue, which may be for certain eventualities like traffic disruption. Therefore, a habitual latecomer has already been distinctly identified. It is considered as usual and results of the internal factor. Consensus is more related to external factors. Consensus is more relevant in group behaviour. You have already read about Elton Mayo's Bank Wiring Experiment, where workers kept the production level constant, despite availability of incentives, i.e., the opportunity to work to earn more by producing more. Consistency in behaviour is more related to internal factors or causation.

*Fundamental attribution error* is caused when we overemphasize the internal causation. This is more evident in performance behaviour. Prevalent down trend in the market is often overlooked, when the marketing team of an organization fails to achieve the target. On the other hand, self-servicing bias error is caused, when we attribute our own success to our own abilities and hard work, while our own failure to the external factors.

Selective perception, halo effect, contrast effect, projection and stereotyping theories of perception are classified under common perception errors while we judge others.

*Selective perception* occurs when people selectively interpret what they see based on their attitude, interest, background and experience. Such approach obviously leads to our perception bias, as subsequently it may transpire, what we perceive about the person is wrong. To avoid such selective-perception bias, it is important to develop our perception about an individual after adequate study, observation, etc.

*Halo effect* influences our perception to judge an individual based on single characteristic, viz., one's intellectual ability, charisma or sociability. To take an example, improvement of sales performance subsequent to the visit of a marketing head, is often attributed to the quality of the marketing head. On the contrary, this could be the result of hard work and focused attention of the sales people, under the direction of the local sales head.

*Projection error* occurs when we perceive a person of our type for the obvious similarity of traits and qualities. Often our expectations are to find similarity of our own traits with the others. Moment we find such similarity, we perceive them to be like us, and in the process, perception error occurs.

*Contrast effects* also distort perception. It is our propensity to evaluate a person in relation to another. It is for this reason the most average candidate for a job interview can become successful, when other candidates for the same job interview are of below average standards.

*Stereotyping error* occurs when we categorize people and events into already known categories. Perceiving woman as a boss often becomes difficult, because we stereotype woman as the secretary. Similarly, we often stereotype police officers as corrupt, while they may be honest.

In an organization, correct perception is important for the successful employment interview, performance expectations, ethics profiling, performance evaluation and employee effort. Moreover, the study of perception is also important to understand the individual decision-making style. A brief outline on decision making is reproduced below.

### Types of Perception

Perception has three levels of complexity: (1) detection, (2) recognition and (3) discrimination. Detection refers to whether people can sense that they are being stimulated by some form of energy. To take an example, a light may be so dim they can barely detect its presence. Recognition means being able to identify, as well as, detect a particular pattern of stimulation. Discrimination means being able to perceive one pattern of stimulation as different from another. To take an example, a person may hear slight differences between two similar musical tones. This is an example from the psychophysics, which investigates into the relationships between the physical properties of stimulus patterns and the perceived effects of stimuli.

### Principles of Perception

Perception process is based on a number of principles. First among those is the 'principle of closure', which means a general propensity of people to perceive things as complete and unified. Engineers when visualize the entire shape from a prototype, they make use of this principle.

The principle of constancy makes us perceive objects as constant in size, shape, colour and other qualities. To take an example, we perceive an orange with its characteristic colour under different kinds of light.

The opposite of the principle of constancy is also valid. At times, a constant object may be perceived as not constant. Good example is a black cube.

Another important principle relates to the perceptual context, i.e., the influence of surrounding conditions on our perception. Often, you have perceived that the reprimand of your teacher is for your development!

## PERCEPTION AND INDIVIDUAL DECISION MAKING

In Chapter-2, we have already discussed about decision making. As decision making is the process to select a course of action from number of alternatives, individual managers while taking decisions, get influenced by their perception. In organizations, by and large individual employees' decisions are based on policy documents; individual preferences can hardly influence the same. This is because policy-bound decisions are structured and cannot be discriminated; else it may create resentment among the employees. But apart from such policy-bound routine and operational decisions; individual employees need to take decisions in contingent situation. Such decisions are highly influenced by the perception of employees. Although to minimize the risk of wrong decisions, organizations often make use of various mathematical tools. Perception, here plays a major role. In order to be a successful manager, one has to necessarily develop decision-making skills.

To avoid decisional errors in individual decisions, organizations often insist on group decision making. In such cases, individual perception can hardly influence

the decisions. Two most widely used techniques for group decision making are: Delphi Group and Nominal Group Method. These we have already explained in chapter 2.

### Perception-Based Individual Decision Making

As a rational decision maker, individual employees or managers of any organization, take decisions based on the availability of information and resource support. Hence, such decision maker takes time to ensure flawless informed decision. Rational decision making follow certain steps, and the decision maker, at every step, needs to apply his/her own perceived ideas to ensure that the plan is flawless.

#### Analysis of Opportunities

Planning requires analysis of opportunities both within and outside the organization. Opportunities need to be weighed in terms of internal strengths and weaknesses of an organization. Opportunities would decide the business focus or establishment of objectives. To take an example, ITC now considers that the diversification into retail business is an opportunity with the changing market scenario, particularly when their tobacco business is increasingly becoming uncertain with the changing regulatory norms globally.

#### Establishing Objectives

Second step in the planning process is the establishment of objectives. Objectives specify what is to be achieved. It gives direction to all planning in an organization. While establishing objectives, it is essential to specify them in measurable terms, so as to subsequently ensure the extent of its achievement.

#### Determining Planning Premises

Planning premises are assumptions about the environment, which decide the field on which planning is made. It lays down the boundaries. Adequate environment scanning has to be made with the emphasis on economic, social, political, competitor's plans, government policies and technological factors. Similarly, internal premises, i.e., premises within an organization have to be studied with the focus on organizational policies, resources, strengths and weaknesses. After such exercise, plans are to be made. Premises, however, are subject to change. This has happened in case of Reliance recently. We all know Reliance has to revise its price tag for mobile services several times within a year. From Rs 10,000, they have now reduced it to Rs 500. Hence, premise control is very important. Most of the organizations make provisions for contingent plan for this.

#### Identification of Alternatives

In the next stage of planning, an organization has to identify different alternatives.

#### Evaluation

At this stage, evaluation of different alternatives is done, and the best course of action in terms of cost benefit is selected.

### Selection

At this point, the plan is adopted after evaluating different alternatives. This is the stage of decision making. It is necessary to also decide about contingent plan at this stage.

### Implementation

At this stage, the plan is put into action. To implement the plan, the manager has to make a series of decisions using his authority, persuasion and policy. Communication of plan has to be made to all cross-sections of people in an organization in order to ensure their participation and support.

### Review

After implementation, the plan has to be reviewed systematically, comparing outcome with planned actions. This facilitates adoption of future plans and even the correction of the deviations in the current plan. Review may even require alteration of current plan in the light of changing circumstances. To take an example, British Telecom had to review its plan eight times in a year and make necessary changes, to keep pace with the changing scenario.

### Non-Rational Models of Individual Decision Making

One of the obvious problems in the rational decision making is its long-drawn process. In reality, all information backup or support may not be available. Secondly, it may not be cost effective for the organization also to lay hands to every possible information. It is for this reason, individual decision makers prefer to take decision based on non-rational models. We have three types of non-rational decision-making models, which are perception based.

#### Bounded Rationality

This, in fact, is a non-rational model. In such case, the individual decision maker tries to justify his/her decision within the ambit of availability of information and the given resource constraint. In other words, it can be called 'thinking on constraint'.

#### Incremental Model

Decisions using such model are essentially short term, and therefore, lack long-term perspective. Such decision makers believe in immediate gains, rather than gains in the long run; hence, they cannot take decision for projects that can give them long-term sustainability.

#### Garbage Can Model

Such decisions are intuition based and largely depend on the gut feelings of the individual decision makers. These types of decision makers are more of gamblers or risk takers, rather than risk averters. Even with 40 per cent probability of success they do not mind to decide. Late Dhirubhai Ambani, the founder of Reliance Group, and Jack Welch, ex-CEO of G.E., often used to take decisions based on their intuition and gut feeling. Obvious danger in such type of decision making is that, it may succeed or may not succeed.

Perception influences individual decision making in terms of choosing the specific style of decision and also in terms of risk-taking and risk-averting attitude on a specific decisional issue. Again, the preference the individual decision maker plays a major role.

### SCENARIO PLANNING AND INDIVIDUAL PERCEPTION OF MANAGERS

Scenarios are the alternative views of the future, primarily based on some events or changes which have occurred or likely to occur. From the organizational point of view, it helps in identifying the strategic-fit, pending some future developments. Essentially, it is reflections on future situations with some frame of references. In other way, we can define scenarios as tools to prioritize our perceptions about future alternatives. Using some set of stories, scenarios are plotted and used as the basis for framing plans and strategies. Using scenarios, managers forecast their proposed change initiatives, reflecting on future situations. For scenario planning, managers or decision makers are required to question the broadest assumptions on the way—the world in general and the organization in particular work, so that decisions can be taken beforehand to meet the gap, if any. Thus to explore the scenarios, managers essentially think about uncertain aspects to unfold any eventual happenings that might cause harm to the organizations.

For economic globalization, understanding global business environment has now become an important imperative for the organizations. Among others, global business environment gets affected by the political changes and new emerging technologies. Such changes create discontinuity in the business, and to sustain, an organization needs to prepare them in advance, chasing those events. Scenario plans help in exploring the eventualities and develop a shared understanding or commitment to the strategic interventions to change the organization, before some unforeseen changes affect the organization's prosperity in the wrong way.

In a turbulent market environment, organizations need to quickly adapt themselves to changes. Such quick response to change is possible only when organizations are capable of preconceiving different scenarios of the environment and accordingly are capable to respond to the changes with adequate contingency plans and prestructured strategies. G. Ringland (1998) and Peter Schwartz (1991) have identified that organizations worldwide are developing scenario plans to respond to the unforeseen change situation. According to Schwartz, scenarios are future contingencies, considering which, organizations are able to determine their future directions with contingency plans.

Literally, a scenario is a script for a play. It is a tool to consolidate one's perception to track the alternative future environments and to take decisions at the right time. According to Pierre Wack (1985), scenario planning involves development of three or four different plots along with the associated narratives to illustrate the major driving forces for change and critical uncertainties in the environment.

Thus, scenario planning is a creative foresight of managers and decision makers to keep pace with the changing environmental uncertainty. It is also considered as a strategic planning method. The key driving forces for the scenario plans are changing social, technical, economic, environmental, educational, political and aesthetic (STEEPA) trends. Globally, we find Shell and Siemens AG have made extensive use of scenario plans.

Shell as an organization has made the most extensive use of scenario planning since 1973 primarily to cope with the oil crisis sparked by the Organization of Petroleum Exporting Countries (OPEC). Shell's strategy was to cope with the environmental turbulence often sparked by the non-compromising OPEC members, who never use to reach to agreement on collective price rising or production strategy. This often caused operational discontinuities in petroleum oil and lubricants POL companies worldwide. Peter Drucker more appropriately said that 'the greatest danger in times of turbulence is not the turbulence—it is to act with yesterday's logic.' Drucker's argument also emphasizes the need for strategic forecasting making use of scenario plans to cope with the organizational change.

### Forces of Scenario Planning

The major driving forces of scenario planning can be categorized into four categories as follows:

#### Social Dynamics

Social dynamics in broadest terms incorporate major demographic trends like, age-mix, income, education and lifestyles and even the change in the value systems. To take an example lifestyle changes now shift customers' perceptions to more value-added products and services. Customers are now more informed, and they can question the company's products and services, when they fail to meet their expectations. Change in the income level also (particularly when it is on the higher side) makes customers to indulge in premium-priced products and services, with more disposable income being available in their hands.

#### Economic Issues

Both macro- and micro-economic trends influence the scenario plans. Macro-economic trends shape the economy as a whole. With more global interrelatedness, failure of one major multinational or transnational organization (like, Lehman Brothers) has a catastrophic effect on many organizations and also the whole world economy. Recent global meltdown and its effects are now an important issue for us to consider. Similarly micro-economic issues like, modus operandi of competing organizations could also spark the need for change and could be a basis for scenario planning.

#### Political Issues

Political beliefs and ideologies of the ruling parties and the strong oppositions, legislative and regulatory changes, etc., could also be the basis for scenario plans for an organization. The US policy on outsourcing particularly of the Government elect, will now be the major issue for the Indian outsourcing business and so also for the IT-enabled Sectors (ITeS).

#### Technological Issues

New emerging technologies influence the business *per se*. With the development of Plasma and LCD technology, conventional CTVs have now become almost obsolete. Similar changes in the CDMA and GSM technology have revolutionized the mobile phone industry. In many other areas, changes in the technology have also influenced the change in their product or service-mix. Organizations that

understand and gauged such changes beforehand, could develop their appropriate action plans to change and accordingly could emerge as the winners. Those who failed to do so have languished behind.

### Steps for Scenario Planning

After understanding the key drivers for scenario plans, it is necessary to follow certain steps in sequential order. Each step necessitates certain actions, and after completion of one step, we need to start another step. In line with the practices of Shell, we can draw the steps as under:

- Identify the drivers for change/assumptions
- Draw a framework of drivers
- Develop some mini-scenarios, preferably seven to nine
- Reduce these scenarios to a manageable number, preferably two to three
- Prepare the draft of the scenarios
- List the issues arising in each scenario

We have already explained various types of drivers for the scenarios. To understand which driver or drivers is/are important at a particular point of time, managers need to first account for the circumstances under which the organization operates, i.e., managers need to make an informed assumption. Use of brainstorming, application of Delphi technique, focus group interviews are some of the common techniques for informed assumptions. To draw the framework of informed assumptions, managers can make extensive use of their intuition or can follow a structured pattern, more in the form of a flow chart. Likewise, they need to act upon at each step to finally draw the scenario and make use of the scenario for framing the strategies for the future of the organization. These steps are also known as *Shell's Model of Scenario Planning*.

### SUMMARY

For engineers, it is also important to study organizational behaviour to understand organization's structure, functions and the behaviour of its people. Organizational behavioural study encompasses both groups, as well as, individuals. The term 'organization' itself represents social collectiveness. Individually, people are the sub-set of collective organizational systems. Again, individual or group behaviour is the function of many factors, which extend to other interdisciplinary fields such as, economics, political science, social anthropology, engineering and human resource management. The scope of organizational behaviour is, therefore, extensive. Thus to understand organizational behaviour, it is essential at the outset to understand the individual behaviour. Perception, as a sub-set of individual behaviour influences organizational behaviour. It is a process of receiving, selecting, organizing, interpreting, checking and reacting to sensory stimuli. In this chapter, we have discussed about perception and how it influences the behaviour of people, particularly in their style of functioning. Various individual decision-making styles and more advanced level of decision making using scenario plans have also been elaborated, particularly to appreciate how people in workplace differs in their style of functioning.

## Key Words

**Sensual Stimulation:** Sensual stimulation could be generated by the supervisors, new procedures of the organization, new machineries, etc. We first register these cues through our sensory and neural mechanisms. We then interpret the stimulus through our motivation, learning and personality, behave overtly or covertly, get the feedback on our behaviour and then face the consequences.

**Principle of Closure:** It means a general propensity of people to perceive things as complete and unified. To take an example, visualization of the entire shape from the prototype.

**Planning Premises:** It is the assumption about the environment, which decides the field on which planning is made. It lays down the boundaries. Adequate environment scanning has to be made with the emphasis on economic, social, political, competitor's plans, government policies and technological factors. Similarly, internal premises, i.e., premises within an organization have to be studied with the focus on organizational policies, resources, strengths and weaknesses. After such exercise, plans are to be made. Premises, however, are subject to change.

**Bounded Rationality:** It is a non-rational model. In such case, individual decision maker tries to justify his/her decision within the ambit of availability of information and the given resource constraint. We can also call it 'thinking on' constraint.

## REVIEW QUESTIONS

1. Define organizational behaviour. Explain why does an engineer need to study OB?
2. What is perception? What are its characteristics?
3. Define perception as a process. Also elaborate the sub-processes of perception.
4. What are the factors that influence perception? As an engineer which factor(s), do you consider, can influence your perception?
5. Explain the theories of perception.
6. What is the relationship of perception with individual decision making?
7. Explain scenario planning. How are scenario plans influenced by individual perception?
8. Short Notes:
  - (a) Incremental Model
  - (b) Garbage Can Model
  - (c) Social Dynamics
  - (d) Principle of Constancy
  - (e) Attribution Theory

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 2009, *Organizational Behaviour – Concepts and Applications*. New Delhi: Oxford University Press.
2. Gibson, E.J. 1969. *Principles of Perceptual Learning and Development*. New York: Appleton-Century-Crofts.

3. Gibson, J. J. 1966. *The Senses Considered as Perceptual Systems*. Boston: Houghton Mifflin Company.
4. Gibson, J.J. 1979. *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin Company.
5. Carteret, E., and M. Friedman. 1978. *Handbook of Perception*, Vols 1–10. New York: Academic Press.
6. Reed, S. 1973. *Psychological Processes in Pattern Recognition*. New York: Academic Press.
7. Ringland, G. 1998. *Scenario Planning: Managing for the Future*. Chichester: Wiley.
8. Schwartz, P. 1991. *The Art of the Long View*. New York: Doubleday Currency.
9. Wack, Piere. 1985. Scenarios: Uncharted Waters Ahead. *Harvard Business Review*, Vol. 63, Issue 6.

# Training, Development and Performance Appraisal

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- appreciate the meaning and significance of Training and Development
- know the classification of training programmes for various levels
- get familiar with induction and orientation
- know various training methods
- comprehend the meaning and significance of performance appraisal
- understand types and methods of performance appraisal

## INTRODUCTION

Training is an important HRD activity which reinforces HRM in an organization. Apart from the need for internal staffing, training enhances job-related skills and also facilitates acquiring of new skills required for averting skill obsolescence in an organization.

HRD is a macro concept and it consists of organized services of learning activities within a given time limit for achieving desired behavioral changes in the people. From the organizational point of view, HRD is a process, and it helps employees to improve their functional capabilities for present and future roles. It also develops their general capabilities, harness their inner potentialities and thereby facilitates for self and organizational development.

Discussions on training, remain incomplete without linking the same to Performance Appraisal. This is because Performance Appraisal is one single important tool, which helps in deciding about the training requirements for an organization and it reinforces training activities. There are a lot of misconceptions about training, education and development functions vis-à-vis HRD, which we have clarified in the introductory chapter. Without

precisely knowing the functions of training, education and development, as was pointed out earlier, it would further make it difficult for us to appreciate the objectives, roles and significance of training in an organization.

## DEFINITION AND PURPOSES

Training may be defined as the systematized tailor-made programme to suit the needs of a particular organization for developing certain attitudes, actions, skills and abilities in employees irrespective of their functional levels. Training, therefore, serves following important purposes for an organization:

- To increase the performance level of an employee and to develop him/her in such a manner that he/she can rise to the position of higher responsibility
- To constantly develop manpower to meet the current, as well as, future needs of the organization
- To ensure effective utilization of human resources
- To integrate individual goals with the organizational goals creating a climate so that an individual employee can best achieve his goals by attending the goals of the organization. To be more specific this is the stage of identifying employees with the organization

## NEED FOR MANPOWER TRAINING

Most of the organizations prefer internal manning of position than external hiring for the obvious motivational benefits and cost effectiveness. Even though training, *prima facie*, puts emphasis on increasing the performance level of an employee, a continuous training function enables the organization to develop employees for the future responsible positions in the organization itself.

The needs for manpower training in an organization may be categorized as follows:

### Updating Knowledge

Technological advancement, business environmental changes and new management philosophies have now made it imperative for the organization to renew and update the knowledge and skills of the employees so that they do not become redundant for the obvious functional incompetence. The first and the foremost need for manpower training, therefore, is to renew and update knowledge and skills of employees to sustain their effective performance and so also to develop them for future managerial positions.

### Avoiding Obsolescence

Recent economic liberalization programmes of Government of India are necessitating organizational restructuring, which *inter alia*, calls for training the employees, irrespective of their functional level, for their redeployment in restructured jobs. Therefore, the second important need for training is to avert functional obsolescence.

## Improving Performance

Continuous training is required to renew and update knowledge and skills of employees. It makes them functionally effective. The third need is therefore, to make employees effective in their performance through continuous training.

## Developing Human Skills

Apart from emphasizing on technical and conceptual skills, new training programmes also put emphasis on developing human skills of employees. Such human skill is necessary for effective interpersonal relations and sustaining healthy work environment. This need for training, therefore, also cannot be altogether ignored.

## Imparting Trade Specific Skills

In industrial employment, the convention is to recruit workers and employees through compulsory apprenticeship training. Such apprenticeship training enables an organization to impart industry- and trade-specific skills to workers. This also, therefore, is an important need for manpower training.

## Stabilizing Work Force

Throughout the world, the importance of training is now increasingly felt for stabilizing the workforce to withstand the technological change and for making the organization dynamic in this changed process. Management theorists now unanimously agree that it is the responsibility of the organization to train and develop their manpower as a continuous process.

## CLASSIFICATION OF TRAINING PROGRAMMES

Depending on the functional level and occupational categories of employees, an organization can classify training programmes as under:

Level	Nos.	Types of Training
<b>1. Workers</b>	(i)	Introduction
	(ii)	Job Training
	(iii)	Craft Training
	(iv)	Special Purpose Training
<b>2. Supervisors</b>	(i)	Induction
	(ii)	Foremanship/Shop floor Supervision
	(iii)	Manpower Management
<b>3. Staff Members</b>	(i)	Introduction
	(ii)	Professional
	(iii)	Technical
	(iv)	Human Relations
<b>4. Managers and Executives</b>	(i)	Induction
	(ii)	Executive Training
	(iii)	Training in Executive Development

Apart from the routine training programmes for different levels, training on Total Quality Awareness and training encompassing all aspects of Total Quality Management have now become almost compulsory for all functional levels.

## Induction and Orientation

These terms are interchangeably used to give a friendly welcome to the new employees as members of the organization so also to introduce the new employees with the available installations (plant and machineries, systems), work norms, organizational objectives and the job positions of the employees. Some organizations make available programmed instruction materials to new employees to help them get acquainted with the departmental rules and regulations, their entitlement for leave, pay, overtime, retirement benefits and other miscellaneous privileges, which affect their whole service. Tata Iron and Steel Company circulate to all their new employees, a brief booklet under the name and style of *Write Your Future in Steel* to illustrate their career prospectus. However, such documented materials cannot be made available by all organizations. They try to supplement it through a brief induction programme.

## Supervisory Training Programme

Supervisors monitor the work of the workers and are arms of the management. They must have adequate skill, experience, ability and leadership. A supervisor is required to do job in five broad areas, i.e., knowledge of the work, awareness of responsibilities, capacity to instruct, skill in improving methods and ability to work with people.

A tentative content of a Supervisor Training Programme may be drawn after the charts of such contents prescribed by Earl Planty and William Mocorx. Refer to Appendix 12.1 at the end of the chapter.

## Training for Top and Middle Management

Top and middle management personnel are trained mainly on following eight areas to expose them to the managerial practices:

### Planning

This covers the policy, general programme and plans of the organization and also methods for effective action.

### Control

Top and middle management personnel have to check current performance against the predetermined standards (as mentioned in the plans) to ensure progress and also to record experience from the working of plans to serve as guide to possible future operations.

### Coordination

The management personnel have to balance the team efforts ensuring proper allocation of activities among different members of the group.

### Motivation

This covers employees' morale given by proper leadership. The art of self-motivation has to be included in the manager and executives.

### Inspiration

It is the act or power of exerting influence on the intellect or emotions, which ultimately leads to the creative thinking and work. Inspiration arouses our mind to special and unusual activity, stimulating our creativity.

### Communication

It is the process of transferring information through interactions with two or more persons. Communication interchanges our thoughts, opinions, sharing of information by speech, in writing or through body language.

### Decision

It is the choice of selecting the best course of action between alternatives. Thus, it helps to come to a conclusive point to solve a problem, selecting the best courses of actions.

### Integration

It helps in establishing link between previously separate systems, services, applications or processes. In manufacturing, integration is a process to combine separately produced components or sub-systems, addressing problems through interactions.

## STEPS FOR DESIGNING THE TRAINING PROGRAMME

In designing the training programme, certain structured steps are followed by the organizations. The reasons behind following such steps are: proper identification of the training requirements and optimizing of the training costs. Based on the organizational practices, the steps for training programmes are discussed as follows:

### Identification of Training Needs

Traditionally, identification of training needs is left with the human resource development (HRD) department. HRD department, to keep pace with organizational requirements identify a series of training modules for different categories of employees and publish such training calendars to circulate among different departments to depute their employees for such training courses. Depending on the facilities available, some of these training courses are also offered utilizing in-house training faculty, while for others (where expertise is not available) such training may either be offered by retaining professional trainers or by deputing employees to attend some outside training courses.

However, to ensure better utilization of employees' acquired knowledge and skill, identification of training needs are now being left with the respective departmental heads, who because of their proximity with the employees concerned can better suggest the training and developmental needs. Hence, right at the beginning of the year, the HRD department circulates the format for suggesting training

requirements of different departments, which after necessary processing are developed as training calendars. The head of the department through performance appraisal, job evaluation and keeping in mind future requirements (due to change of technology, etc.) may identify such training requirements and also study the cost-benefit aspect by closely monitoring post-training performance of the employees.

Incidentally, it has now also become an important corporate practice in line with the ISO Certification requirement.

The following steps are involved in designing the training programme:

- (a) **Selecting Strategies:** The first step is to choose a strategy for training methods. Strategies prioritize the training objectives and also help in selecting training areas which may be skill formation, development of conceptual understanding, etc.
- (b) **Breaking Objectives:** The second step is to break the general training objectives into different parts like, knowledge, understanding and skills. Each constituent part of the training objective is matched with appropriate training events.
- (c) **Choosing Methods:** The next step is to use specifications for different training methods to decide over time and the facilities required for the programme as a whole.
- (d) **Deciding on Packages:** The fourth step is to decide different package in which programmes could be offered. An organization, at this stage, considers different training packages, keeping in view the time and cost aspects.
- (e) **Designing the Programme:** The final step is to design the training programme.

## SEQUENCE OF A TRAINING PROGRAMME

Any training programme should follow the order of sequence of action, as under, to make it effective.

- (a) Designing the programme matching with the learning process
- (b) Matching the programme to the organizational expectations
- (c) Developing the training group
- (d) Identifying the themes of training and development
- (e) Achieving consistency in training

## NEED FOR A TRAINING POLICY

To ensure consistency in training and development function, the HRM department of each organization develops a suitable training policy, defining the scope, objective, philosophy and techniques. Such a training policy, *inter alia*, serves the following purposes—

- (a) It defines what the organization intends to accomplish through training.
- (b) It indicates the type of persons to be responsible for training functions.
- (c) It identifies the formal and informal nature of training.

- (d) It spells out the duration, time and place of training.
- (e) It indicates the need for engaging outside institutions for training.
- (f) It embraces and includes training in relation to labour policies of the organization.

### TRAINING METHODS

The following methods are mostly used for training the employees.

#### On-the-Job Training

Under this technique, an employee is put on-the-job and is trained to perform the said job, thereby helping the employee to acquire the skills for performing the said job in future. Most of the organizations utilize the services of senior workers to impart such training. Apprenticeship, creation of assistant to positions, job rotation and special assignments are different nature and forms of such training programmes.

#### Job Instruction Training

This is training through step-by-step learning. Usually, steps necessary for a job are identified in order of sequence, and an employee is exposed to the different steps of a job by an experienced trainer.

#### Vestibule Training

This method duplicates on-the-job situation away from actual worksite with machinery and equipment similar to those used in the actual production or operation and is used to help employees to acquire a new skill. Usually, training is given away from the production centre.

#### Training Centre Training

Such site trainings are given in the form of lectures, conferences, case studies, role playing and discussions.

#### Simulation

Simulation again duplicates the actual condition encountered on a job. The vestibule training method and the business game method are the examples of business simulation.

#### Apprenticeship

Such training is given for a longer duration to help the employees acquire skills in specific trade(s). A major part of this training is given on the job.

#### Off-the-job Methods

These methods consist of the following:

- (a) Lectures
- (b) Conferences

- (c) Group Discussions
- (d) Case Analysis
- (e) Role Playing
- (f) Programme Instruction
- (g) T-Group Training

#### Lectures

Through lectures, participants are motivated to learn. Lectures focus on the understanding rather than enriching knowledge and skills through reading assignments and experience. However, empirical studies on the effectiveness of training through lecture methods indicate that this is not effective for the obvious inability of participants to retain the information. Often, trainers also fail to make such sessions more interesting relating to on-the-job experience.

#### Conference Method

It is a participative group-centred method through which participants develop knowledge and understanding by small group discussions and active participation.

#### Group Discussions

Group discussion is also a very useful method of training and is usually based on papers prepared by trainees on a given subject. The trainees read their papers, which are usually followed by critical discussions. It may, however, be a follow-up discussion on some statement or on a paper presented by an expert.

#### Case Study

Case study helps students to learn on their own by independent thinking. A set of data or some descriptive materials are given to the participants asking them to identify and analyse the problems and also to recommend solutions for the same.

#### Role Playing

This training method particularly helps in learning human relations skills through practice and imbibing and also through insight into one's own behaviour. Trainees of such programme are informed of a situation and asked to play their roles in such (imaginary) situation before the rest of the class. This, therefore, helps in enriching interaction skills of the employees.

#### Programmed Instruction

This method is prearranged desired course of proceeding to the learning or acquisition of specific skills or knowledge. Information in such programmes are conveniently broken into different units, to allow the trainees to learn at their convenient pace.

#### T-Group Training

T-group is sensitivity training. It takes place under laboratory conditions and is mostly instructed and informal kind of training. Trainer in such a training

programme plays a role of a catalyst. He helps the individual participants to understand how others perceive his behaviour, how he acts to others' behaviour and how and when a group acts either in a negative or in a positive way.

### E-learning

Training programmes delivered via Intranet have now been considered as the most cost-effective route. It is not only cost effective but also caters to the real-time information need of employees. However, it involves convergence of several technologies like, hardware, software, web designing and authoring, instructional design, multimedia design, telecommunications and finally Internet-Intranet network management. Organizations can outsource e-learning training modules at relatively cheaper rate. Even though training through e-learning is globally increasing, we do not have adequate empirical evidence to justify this.

## PERFORMANCE APPRAISAL

Performance means the degree or extent with which an employee applies his skill, knowledge and efforts to a job, assigned to him and also the result of that application. Performance appraisal means analysis, review or evaluation of performance or behaviour analysis of an employee. It may either be formal or informal, oral or documented, open or confidential. However, in organizations, we find formal appraisal system in the documented form. It is, therefore, a formal process to evaluate the performance of the employees in terms of achieving organizational objectives.

Like any other function, performance appraisal is also an important management activity.

### Importance

For all important decisions concerning people, like transfer and promotion, remuneration, reward, training and development, so also for the long-term manpower planning and organization development, performance appraisal is necessary. A well-documented performance appraisal system helps in understanding the attributes and behaviours of employees. It is also necessary for motivation, communication, strengthening superior-subordinate relationship, target fixing (key performance areas/key result areas), work planning and also for improving the overall performance of the organization.

### Functions

The primary functions and objectives of performance appraisal are:

- To identify and define the specific job criteria. Many organizations at the beginning of the year set Key Performance Areas (KPAs) or Key Result Areas (KRAs) for employees based on mutual discussions
- To measure and compare the performance in terms of the defined job criteria, KRAs and KPAs are also designed so that it can help in measuring job performance in quantitative or qualitative terms
- To develop and justify the reward system, relating rewards to the employees' performance

- To identify the strengths and weaknesses of employees and to decide on proper placement and promotion
- To develop suitable training and development programmes for enriching performance of the employees
- To plan for long-term manpower requirements and to decide upon the organizational development programmes, duly identifying the change areas (for overall improvement of the organization)
- To identify motivational reinforcers, to develop communication systems and also to strengthen superior-subordinate relationships

### Objectives

- A performance appraisal system tries to serve various purposes and attain a number of objectives. The major objectives of performance appraisal system may be classified as remedial, developmental, innovative and motivation.
- Developmental objectives stimulate the growth of the employees both in their present and future jobs. Thus, it identifies training and developmental needs, ensures placement and promotion, etc.
- Innovative objectives are for discovering ways to deal with a new job and also to identify and develop better ways for existing jobs.
- Motivational objectives are for rewards, motivation and effective communication and also for better interpersonal relations.

### Types and Methods of Performance Appraisal

Different methods of performance appraisal are followed in different organizations to achieve the above objectives. Since some methods of performance appraisal are complicated and calls for adequate knowledge in quantitative techniques, many organizations follow traditional methods of appraisal while others consider modern methods as the basis for evaluating job performance of their employees.

#### Traditional Methods

Traditional methods of performance appraisal may be categorized broadly under the following heads:

##### Straight Ranking Method

This is the oldest and simplest method of performance appraisal by which employees are tested in order of merit, giving some numerical rank and are placed in a simple grouping. Such grouping separates employees under each level of efficiency, which may vary from the most efficient to the least efficient. Since, it is a blunt quantification of performance, it does not account for behavioural parameters and only considers an individual employee's level of efficiency in relation to others. For such obvious deficiency, this system does not provide any scientific basis for performance appraisal of employees.

### Paired Comparison Technique

This is a somewhat better method of performance appraisal as each employee is compared with others in pairs at a time. For each performance trait, an individual employee's performance is tallied with others in pairs, and then the rank order is decided. This system is also not suitable in those cases where the number of employees is usually high. For better comprehension, a sample table of comparison on trait reliability is presented below:

For Trait Reliability of Person Rated

As Compared To	A	B	C	D	E
A	X	-	-	-	-
B	X	+	-	+	-
C	+	-	X	-	-
D	+	-	+	X	-
E	+	+	-	+	X

### Man-to-Man Comparison

Under this method, certain factors are selected for analysis like, leadership, initiative, interpersonal relationship, etc., and a scale is designed by a rater for each such factor. After rating such factors individually, the aggregate performance of an individual employee is decided, and such aggregative performance is also given a scale. Likewise, an individual employee is considered with others. This method is somewhat like factor comparison method and is widely used in job evaluation. Since developing uniform rating scale is a complicated task, this factor is not much in use for performance appraisal of employees.

### Grading Method

Under this method, certain features worth understanding the performance of an employee are identified. Such features may be leadership, communication power, analytic ability, job knowledge, etc. The raters mark/rate such features according to a scale and match the employees' performance in comparison to his/her own developed grade definition. To take an example A, B, C, D, E types of grade definitions for each feature may be developed by a rater to indicate the ratings—A= very significant, B= Significant, C = Moderate, D= Average, E= Poor. Such types of grading are of much use for selection of an employee or grading them in written examinations.

### Graphic or Linear Rating Scale

Such a rating scale is normally a continuous scale which enables a rater to mark somewhere along a continuum. Usually, a printed form is given to a rater along with the factors to be rated, giving a continuous scale against each such factors. This method, therefore, enables quantification of performance scores and also helps to analyse its significance using statistical techniques. Since making a rating

checkbox is difficult for obvious difference in individual characteristics of each job, this system may not always ensure objective appraisal.

### Forced Choice Description Method

It is a combination of objective and subjective judgement on an individual employee's performance against each rating element. Positive and negative phrases are given asking the rater to indicate applicability of such phrases as objectives in describing the employee whose performance is rated. For its obvious complexity, this system is not much in use.

### Forced Distribution Method

It is a method to evaluate employees' performance according to a predetermined distribution scale. To take an example, under such a method, the rater is asked to distribute 5 per cent of the total employees on top of the scale, indicating their superior performance and promotability, 10 per cent may be put immediately under this level, indicating their good performance and future promotability. This system is easy to understand and can be applied in organizations without much hassles.

### Checklist Method

It is a mere process of reporting employees' performance, compiling yes/no responses. Final rating is done by the personnel vis-à-vis HRD department based on such reports. Since this is not an objective method of appraisal, it is not free from bias.

### For Easy Method

It is open-ended qualitative appraisal of employees' performance, giving an opportunity to the rater to put down his impression in subjective form on the important job factors. Since it is descriptive and essay type, it is likely to be biased, and judgmental errors may crop in.

### Critical Incident Method

This method measures employees' performance in terms of certain 'events' or 'critical incidents' instrumental for success or failure on the job. Such critical incidents are identified by the rater after in-depth study of the employees' working. As negative incidents get more focus and since recording of incidents demands for the utmost care, this method is not free from defects.

### Group Appraisal Method

It is an evaluation of an employee by multiple judges. The immediate supervisor of the employee and a few other top-level personnel discuss the performance standards and then evaluate the performance of the employee. The greatest advantage of this method is that it is relatively free from bias, even though it is time consuming.

### Field Review Method

This type of review is conducted by the HR department by interviewing the supervisor of an employee to understand the subordinate employees' performance. Normally, for such type of appraisal, the appraiser, i.e., the representative of the human resource department, gets equipped with certain questions and asks those questions about the employees, whose performances are to be reviewed, to their respective supervisors, more in the form of informal interview. Since this process of appraisal is an indirect method of appraising the performance, it may not always reflect the true performance level of the subordinate employees. Such an interview always has sensitizing effect on the interview, whose responses may be some opinionated generalization. Moreover, this method keeps the key managerial personnel always busy for appraisal. Despite such defect, organizations prefer to have this type of appraisal for lower-level employees, since this process is simple and easy to administer.

### Modern Methods

The traditional methods of performance appraisal, discussed above, suffer from major limitations for their obvious emphasis on assessing individual performance or task, considering it as an isolated factor. To eliminate such narrow and partial approach, the newer techniques of performance appraisal have been developed and are widely practised by the organizations, particularly for managerial and supervisory employees. Some of the modern techniques are discussed below:

#### Appraisal by Results for Management by Objectives

Management by objective (MBO) is a comprehensive management approach which is adopted for performance appraisals and so also for organizational development. When MBO is used for performance appraisal only, its primary focus is on developing objective criteria for evaluating the performance of the individuals. Identification of common goals is jointly done by the superior and subordinate managers of an organization. After such identification, each individual's major areas of responsibilities are defined. Such defined responsibility becomes the basis for evaluating the performance of an individual employee.

Most of the organizations put emphasis on developing KRA's through MBO exercise, since this approach necessitates joint meeting of the supervisor and the employee to define, establish and set goals or objectives, which the individual employees would achieve, within a prescribed time limit (mostly it is the form of early targets). Such an exercise also establishes ways and methods to measure performance. Goals are mostly work related and career oriented and are integrated with overall organizational objectives. Periodic evaluations of employees' performances are done in terms of goals, and if required, goals may be revised. MBO also calls for superior-subordinate interaction and supportive role of the supervisor, which, as well, includes counselling or coaching.

However, an MBO system lays more stress on tangible goals and hence, intangible goals like morale, good interpersonal relations, commitment to the job, etc., are often ignored. Moreover, MBO exercise is both time consuming and money consuming.

### Assessment Centre Method

This method is to test candidates in a social situation by a number of assessors, using a variety of criteria (which may be a paper pencil test, interviews, in-basket exercise, business game, role playing incident or a leaderless discussion). The assessors or evaluators are drawn from experienced executives, working at different levels of management. Under this method, performances of employees are evaluated both individually and collectively. This method is useful in measuring interpersonal skills, organizing and planning ability, creativity, resistance to stress, work motivation, decision-making power, etc.

### Human Asset Accounting Method

This method attaches money estimates in the value of manpower of an organization. The process is somewhat like estimating the goodwill value and can be appraised by developing a procedure to undertake periodic measurement of certain variables. Such variables are either categorized as key variables or intervening variables. Key variables are policies and decisions of an organization, its leadership strategies, skills and behaviour of an employee, etc. Intervening variables are loyalties, attitudes, motivations, interpersonal relations, communication and decision making. Measuring such variables over several years, the quantification of human assets is difficult for the obvious problem in developing the accounting procedure. It is not a very popular method of performance appraisal. This system is more appropriately used for evaluating the collective performance of an organization, rather than the individual appraisal of an employee. This method is useful for organizational development, as it helps in identifying the changed areas more scientifically than any other method. This method has been discussed in a separate chapter.

### Behaviourally Anchored Rating Scales (BARS)

This method helps in measuring and improving job performance more accurately. For each performance area, some standard statements are provided. These are then put on the scales in BARS. While developing such BARS, group discussions are conducted to identify significant job dimensions that need to be evaluated. BARS may be of different types for different job dimensions. Normally, BARS are presented vertically with scale points ranging from five to nine. Due to its behavioural orientation, it is considered as the most useful techniques of performance appraisal. Moreover, this system provides opportunity to both appraisee and appraiser to interact and participate in developing standards for each performance area. However, despite all these advantages, organizations try to avoid this method of appraisal because of its time-consuming and painstaking process.

### 360 Degree Appraisals

This appraisal method is now largely in use throughout the world. It requires performance feedback from all important stakeholders of the organization like the appraisee himself, his superiors, peers, other team members, customers and suppliers. Apart from its effectiveness in reporting performance, this method also ensures total employee involvement (TEI) and employee empowerment. This method also reduces subjective evaluation system in an organization.

### Potential Appraisal

Potential appraisal is a holistic approach for studying wholesome qualities of an employee with a given intellect, personality and character. Industry practices apply two widely used approaches for potential appraisal, i.e., helicopter and whole person qualities. Helicopter method tries to measure the potentiality of a person on large, as well as, on specific issues. Whole person qualities method measures the wholesome qualities/potentialities of a person with a given set of variables, mentioned above, which are already determined for the person. Potential appraisal data is extremely useful for career planning, as the latent abilities of an individual can be captured and matched with the future role and responsibilities. However, in India, we do not have documented practices on potential appraisal in the corporate world.

### Steps to Performance Appraisal

Irrespective of the methods applied for performance appraisal, its steps follow more or less a set pattern, which are listed as below:

- (a) Establishment of performance standards. This is done mostly while developing job description
- (b) Communication of standards to the employees
- (c) Measurement of performance
- (d) Comparison of performance with the job standards
- (e) Discussing the appraisal results with the employees
- (f) Initiating the corrective action, where necessary

### PERFORMANCE COUNSELLING

It is a process of advising an employee, listening to his problems and enabling him to find a satisfactory solution on his own. Performance counselling is a process to help subordinates to analyse their performance objectively. It helps in identifying training and development needs and also ensures improvement in future performance of an employee.

Primarily, performance counselling attempts to help an employee in the following ways.

- (a) It helps an employee to understand his own strengths and weaknesses. More effective counselling sessions even enable employees to make their independent SWOT analysis, i.e., analysis of strengths, weaknesses, opportunities and threats. This means that opportunities and threats in achieving the performance can also be made clear to such employees for their independent performance.
- (b) Since good performance counsellor believes in giving feedback information about the employees' behaviour, so also their performance, performance counselling helps in improving professional and interpersonal competence of employees.
- (c) It helps in setting goals, formulating action plan for further improvement of employees.

- (d) It helps the employees to identify different alternatives for dealing with problems.
- (e) Since a good performance counselling is supportive and empathetic, employees feel encouraged to openly discuss their aspirations, conflicts and problems.

### Conditions for Effective Performance Counselling

Conditions for effective performance counselling may be listed as follows:

- (a) A climate of mutual trust, confidence and openness need to be ensured at the outset.
- (b) Climate should be such that it can ensure subordinates' free participation in the review process and also in their giving the correct feedback. This is important as counselling is not a one-way process of communication, but a two-way traffic.
- (c) The focus of performance counselling is on employee development. Employee development should not be considered isolated from other issues of performance appraisal, i.e., remuneration and rewards, promotion, motivation, etc.

### Different Phases of Performance Counselling

There are different phases of performance counselling process. They are mentioned below:

#### Rapport Building

The first phase of performance counselling is rapport building, i.e., establishing a climate of acceptance, support, openness, etc. Subordinates should be assured in this phase that their superiors are keenly interested in their development. A successful rapport-building phase, therefore, generates confidence in the employees, which facilitates free sharing of perceptions, problems, conscience, feeling, etc.

#### Exploration

In this phase, apart from visiting the employees and creating a climate of openness, the counsellors help the employees to understand their strengths, weaknesses, opportunities and threats. The success of this phase lies in making the employees discover all these on their own and at the same time initiate remedial measures independently.

#### Action Planning

Specific plans and actions for the development of employees are identified at this phase of performance counselling. The counsellor helps the employees to implement such action plans for effective results. For making such action plans acceptable, some counsellors prefer to develop the action plans exposing employees to a series of brainstorming sessions. This process enables the employees to develop the action plans independently.

## Performance Counselling Process

The counsellor in performance counselling sessions should be an excellent listener. He should pay attention to the ideas, feelings and sentiments of the person being counselled. This enables the counsellor to understand and analyse the subordinate's concern. The effectiveness of performance counselling session, therefore, depends on efficiency in asking questions. The questions should be open-ended and empathetic and should be framed in such a way that they should try to seek constructive suggestions from the subordinates. The questions should not be critical or should not appear as if the intention of the counsellor is to test or evaluate the subordinate person.

Secondly, performance counselling process should ensure communication of feedback to the subordinates in such a manner so as to evoke constructive response from them. Since, giving negative feedback is embarrassing, feedback should always be descriptive and non-evaluative. It should be focused on the behavioural attributes, rather than on the subordinate himself. Feedback should be made more data based and suggestive. It should be continuous and verifiable.

## Counselling Interview

Before beginning the counselling session, the counsellor needs to study subordinate's job responsibilities, his education, training and experience, job performance and his past jobs. He should make adequate planning of the discussion, and determine the developmental needs for discussion with the employee.

The interview should be sincere, informal and friendly. The counsellor should explain the purpose of the discussion to the interviewee and also emphasize the fact that the interview is essentially a two-way communication. The subordinates should be encouraged to discuss their own appraisals about themselves. The counsellor should focus on the strong points and encourage the subordinates to suggest their own developments. It is essential for the counsellor to reach an agreement on developmental plans and also to summarize the points discussed in the session at the end of the interview. He should make record of plans that are mutually agreed to in the interview.

## SUMMARY

Training and performance appraisal reinforce human resource management in an organization. In this era of technological change and global competitiveness, organizations are constantly required to renew and update the skills of their people, or else they are likely to encounter the problem of manpower obsolescence, which among others, would call for frequent downsizing or rightsizing. While performance appraisal updates organizations to take a stock of their skill inventories, training helps to address the skill-gap. In a separate chapter, the need for skill and competency mapping to appreciate the contemporary trends in the corporate world have been discussed.

## Key Words

**Training Cycle:** It is a systematic goal-oriented approach that produces results not only for the learner but also for the organization.

**Cost-Benefit Analysis of Training:** It helps an organization to measure the cost benefit of training, keeping in view the long-term perspectives. Thus, this analysis makes incremental (short-term) approach redundant.

**KRAs:** Key Result Areas, developed in the form of performance targets through mutual discussion between the boss and the subordinate.

**KPAs:** Key Performance Areas. Like KRA, KPA is also developed in the form of performance targets through mutual discussion between the boss and the subordinates.

**MBO:** Management by Objectives, which principally set the direction to adopt a focused approach (in line with the objectives of the organization) in managing the organization.

**Vestibule Training:** This method duplicates on-the-job situation away from actual worksite with machinery and equipment similar to those used in the skill. Usually, the training is given away from the production centre.

**Induction and Orientation:** These terms are interchangeably used to give a friendly welcome to the new employees as the members of the organization and also to introduce the new employees with the available installations (plant and machineries, systems), work norms, organizational objectives and the job positions of the employees. Some organizations make available some programmed instructional materials to new employees to help them to get acquainted with the departmental rules and regulations and also their entitlement for leave, pay, overtime, retirement benefits and other miscellaneous privileges, which affect their whole service.

**Behaviourally Anchored Rating Scales (BARS):** This method helps in measuring and improving job performance more accurately. For each performance area, some standard statements are provided. These are then put on the scales in BARS. While developing such BARS, group discussions are conducted to identify significant job dimensions that need to be evaluated.

## REVIEW QUESTIONS

- 1 Identify the need for manpower training in an organization. What are the important purposes served by training?
- 2 List out training programmes for different levels of employees and elaborate at least two such types of training programmes for workers.
- 3 What are the steps involved in designing a training programme? What sequence of actions usually a training programme follows?
- 4 Do you think there is any need for a training policy in an organization? Briefly outline some of the areas which need to be focused in such a policy.
- 5 Develop at least three sample training modules for supervisors, duly pointing out their objectives, course contents, eligibility of participants, duration, etc.
- 6 What are the different training methods available for an organization? Which are the methods you recommend for white-collared and blue-collared employees respectively?
- 7 Do you think recent economic liberalization programme of the Government of India has made training function more important for an organization? Elaborate

answer duly listing relevant training areas in the context of changing environment.

Define performance appraisal. Briefly state its importance and objectives. What are the steps you would follow for appraising the performance of a managerial employee?

9. What are the different performance appraisal systems followed in an organization? Select at least five methods and briefly discuss their strengths and weaknesses.
10. Traditional performance appraisal system emphasizes the assessment of the individual performance as an isolated factor. Briefly discuss the newer techniques of performance appraisal, critically reviewing the shortcomings of traditional system.
11. Discuss the effectiveness of MBO and BARS in performance appraisal. Develop KRAs for a HR Manager of an organization and identify five important performance criteria for assessing the performance on a six-point behaviourally anchored rating scales.
12. Critically review the performance appraisal system in India. Elaborate your answer visiting at least two organizations.
13. Develop a standard performance appraisal form for supervisors in an organization, selecting at least ten factors for review. Recommend your proposed development plans for such supervisors based on your review.
14. Briefly state the importance and objectives of performance counselling. What are the conditions for effectiveness of performance counselling?
15. Short Notes:
  - (a) T-Group Training
  - (b) Role Playing
  - (c) Vestibule Training
  - (d) Simulation
  - (e) Orientation Programme
  - (f) Human Skills
  - (g) Counselling Interview
  - (h) Assessment Centre Method
  - (i) Field Review
  - (j) Critical Incident Method
  - (k) Key Performance Areas

## REFERENCES

1. Bernardin, H.J., and R.W. Beatty. 1984. *Performance Appraisal: Assessing Human Behavior at Work*. Boston: Kent Publishing Company.
2. Bhattacharyya, D.K. 2006. *Human Resource Management*, 2nd edition New Delhi: Excel Books.
3. Bhattacharyya, D.K. 2007. *Human Resource Research Methods*. New Delhi: Oxford University Press.
4. Bhattacharyya, D.K. 2009. *Organizational Behaviour*. New Delhi: Oxford University Press.
5. Brown, D., R. Caldwell, and K. White. 2004. *Business Partnering: A New Direction for HR. A Guide*. London: Chartered Institute of Personnel and Development.
6. Leonard-Barton, D. 1992. 'The Factory as a Learning Laboratory'. *Sloan Management Review* 34 (1): 23-38.
7. Murphy K.R., and J.N. Cleveland. 1991. *Performance Appraisal: An Organizational Perspective*. Boston: Allyn and Bacon.
8. Nevis, E.C., A.J., DiBella, and J.M. Gould. 1995. 'Understanding organizations as learning systems'. *Sloan Management Review*, Winter, Pp. 73-85.

## Contents of Supervisory Training Programme

Administrative Training	Orientation Training	Human Relations Training	Technical Training	Teacher Training
<p>Duties and responsibilities of a supervisor</p> <p>Basic principles of industrial organization</p> <p>Discipline and Control</p>	<p>The company size, structure of organization, history, market share, achievements, objective and mission</p> <p>Product training</p> <p>Shop floor rules and regulations</p> <p>Personnel policies</p> <p>Union contract, company Services</p> <p>Service departments</p>	<p>Induction of new employees, giving orders and directions, communication</p> <p>Developing understanding, Correcting subordinates</p> <p>Inculcating initiative and confidence</p> <p>Placement and supervision</p> <p>Job evaluation, performance measurement and incentives</p> <p>Reducing absenteeism and labour turnover</p> <p>Self improvement</p> <p>Grievance handling</p> <p>TQM, Small group activities</p> <p>Employee empowerment</p>	<p>Basic science, mathematics and statistics</p> <p>Special technical training</p> <p>Trade training</p> <p>Training on costing methods</p> <p>Training on time study and other industrial engineering techniques</p> <p>Production planning and control</p> <p>Labour legislation</p> <p>TQM and ISO: 9000</p>	<p>Instructor Training</p> <p>Conference</p> <p>Leadership</p>

**Feedback Form**

Training Programme on Strategic Human Resource Management

- What was your expectation in joining the programme? (Indicate your choice in order of preference, if any).
  - To get some insights to the new concept
  - To understand the relevance of the content in present day business situation
  - To apply the learned skill in my present organization
  - To have a break and no utilize time for a meaningful cause
  - All the above
  - None of the above
- Do you think, your expectations have been fulfilled, (please tick your answer)
  - Very significantly
  - Significantly
  - Partially
  - Not at all
- In columns 'b' and 'c' below, select a number that represents your opinion using the five-point scale (from low to high); also indicate your view on 'd' and 'e'

A	B	C	D			E	
Topic	Gained New Information	Presentation	Time allotted			This was Difficult	
			More	Less	Right	Yes	No
Topic 1	1 2 3 4 5	1 2 3 4 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Topic 2	1 2 3 4 5	1 2 3 4 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Topic 3	1 2 3 4 5	1 2 3 4 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Case Study	1 2 3 4 5	1 2 3 4 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
HR Games	1 2 3 4 5	1 2 3 4 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

- Indicate three changes you would like to make to the course.
- Which aspects of the process helped you to learn?
- Which aspects of the process were not liked by you?
- How do you rate the over-all course?
  - Excellent
  - Good
  - Moderate
  - Average
  - Poor
- Any general suggestions?

Name:

Signature with date

# 13

## Communication in Organizations

### LEARNING OBJECTIVES

After reading this chapter, a student would be able to:

- comprehend definition and concepts of communication
- know the various types and nature of communication
- understand effective communication techniques
- appreciate the psychological and behavioural influences on communication
- get familiar with group communication
- understand the barriers to communication
- comprehend transactional analysis
- know basics of negotiation

### INTRODUCTION

The word communication has many ramifications. It is basically a process of interaction with people and environment. Through such interaction two or more individuals influence the ideas, beliefs and attitudes of each other. Such interaction takes place through the exchange of information through words, gestures, signs and symbols and expressions. In organizations, communication is a continuous process of giving and receiving information that builds social relationships. The word communication is derived from the word 'communis', which means common because commonness of understanding is an essential component of all kinds of communications, more particularly in organizational communication. Without the common understanding, communication in organizations creates more misunderstandings, and people may become direction less. Today in organizations, we talk about shared vision. To develop a shared vision, we need an effective mechanism for communication. Even for day-to-day operational issues, communication plays a great role in clarifying doubts and in making the efforts of the people result oriented. What is important

for us to understand that in our ancient texts, we have enough reference of non-verbal communication between the man, nature and the other animals. In Indian Gurukul system of learning, communication with nature and animals was considered as the best way to reinforce learning. Therefore, communication is as old as our civilization. Even in pre-civilization days, non-verbal communication was in existence between man, nature and animals. In today's organizations, however, language-based or verbal communication is more important. With language, communication between the organizations and the outside become much more effective and global. With market globalization, English language as a medium of communication has been accepted even by the countries like China, Japan, Russia, France and Germany, where previously their own respective mother tongues were more predominant. However to foster economic relations with other countries of the world, they have gradually started communicating in English. Therefore, with language, communication in organizations becomes much more simple and meaningful.

### DEFINITION AND CONCEPTS

An all-inclusive definition of communication is difficult to develop for its obvious all-encompassing effects. Hence to the extent possible, we will restrict our effort to define communication in organizational context. Denis Mcquail defined communication as 'a process which increases commonality.' Carl Hovland, on the other hand, defines it as 'a process by which an individual communicator transmits to modify the behaviour of other individuals.' Warner Weaver, going one step further considers communication as 'the procedure by which one mind can affect another.' According to American College Dictionary, 'communication is the imparting or interchange of thoughts, opinions or information by speech, writing or signs.' From organization's point of view, therefore, communication has the features of interaction, interchange, sharing and commonness.

### ELEMENTS OF COMMUNICATION

From the above definition, we can identify following elements of communication.

- Communication is a two-way process. It involves a sender and receiver. The sender or receiver can be an individual or a group.
- All communication carries a message. Message can be an information, a directive, an enquiry, a feeling, an opinion an idea or any other.
- Communication can occur only when there is commonness of understanding between the sender and the receiver. The commonness includes factors like common culture, common language and common environment. Words, phrases, idioms, proverbs, gestures and expressions are deeply influenced by culture and possess high communicative potential for people from similar background.
- Communication must be able to evoke response from the receiver, evident in the form of some behavioural changes.
- Communication method can be given words or non-verbal like, signs, gestures, expressions, etc.
- All these five elements can also be called as the process of communication, i.e., Sender - Message - Method - Receiver - Response of Receiver.

### NATURE OF COMMUNICATION

Communication can be broadly divided into two broad categories. These are:

1. Verbal Communication
2. Non-verbal Communication

**Verbal Communication:** It is the use of words and languages to interact between two or more individuals. It can be either oral or written. Hence speaking, listening, reading and writing are all classified under verbal communication. Since this type of communication elicits immediate feedback, in organizations, we make an extensive use of verbal communication.

**Non-verbal Communication:** It can occur without use of words. This type of communication sensitizes our senses and thereby evokes responses, depending on the way we interpret a particular cue. It is often referred to as body language, i.e., any non-flexile or reflexile body movement of the communicator which carries some meaning. Gestures, facial expressions, glance, stare, smile, raising of finger are some examples of body language, which carry some meaning. In organizations, non-verbal communication is very important for interpersonal relations.

Based on organizational practices, communication can further be divided into internal and external, formal and informal, downward, upward and horizontal, diagonal and grapevine. Flow of information within the organization is known as *internal communication*, which may be either formal or informal in nature. *External communication* takes place between two organizations, i.e., between the organization and others outside the organization. *Formal communication* is official communication, whereas, *informal communication* takes place within the formal organization, between the members. *Downward communication* is between the superiors and subordinates and *upward communication* is between the subordinates and the superiors. In the first case, the superiors communicate with the subordinates, while in the second case, subordinates communicate with the superiors. *Horizontal communication* takes place between two equals, i.e., between the persons working at the same level in organization. *Diagonal communication* takes place cutting across the hierarchical barriers. However, this is formal in nature. To take an example, direct communication from a field sales person to the vice president (HR) is diagonal in nature. Notice they are functionally apart and also hierarchically different. Grapevine communication is defined as more unofficial nature of communication, i.e., not from the official channels. It may be good or bad. Often managers deliberately make use of such communication mode, to understand the pulse of the workers on some possible change implementation programmes. However, it can also be damaging, when it becomes unhealthy rumours, as it creates tension among people. Apart from these various types of communication, we have the system of network communication for globally dispersed organizations.

### EFFECTIVE COMMUNICATION

Effective communication is the basic need of an organization. Since effective communication develops commonness of understanding about organizational issues, managers need to understand the communication dynamics. Some of the important features of effective communication are:

### Common Frame of Reference

The sender and the receiver should interact at a common level of understanding. If managers communicate with their down-the-line people in their own perceived languages, they will never be able to achieve the results. We can actually understand this basic requirement from our family. We interact with the children in their perceived languages and symbols. Without common frame of reference it is quite unlikely to develop common level of understanding. Hence, the managers need to communicate in such a manner so that receivers of their communication can understand it. This we have also learned from the world-class corporate leaders, who prefer to talk to workers in their (workers') perceived way. To understand the common frame of reference, managers first need to understand the people around them and their behavioural pattern, interpersonal skills and knowledge base.

### Mutual Congruence

Communication contents in organization should be of mutual congruence, i.e., it should be on common interest of both the senders and the receivers. Many organizational problems are now resolved adopting the goal congruence model. Often, the erring workers do not listen to the managers, unless the managers communicate, keeping in view their interest areas. In dealing with the collective bargaining issues, unions generally show reluctance to understand financial ratio to comprehend company's financial health; rather, they feel more interested in receiving the information in simple factual terms.

### Compatibility in Communication Language

Delivering a lecture in English to workers in a training session, who are not comfortable with the language, serves no purpose. To make the training message clear, rather we have to communicate with workers in their own understandable language. Dr Ishikawa of Japan carried the message of quality, adopting statistical process control tools of Deming and Juran of USA, developing fish-bone diagram. Cascading the message of quality successfully to the workers' level, in their perceived style, helped Japan to excel in quality.

### Compatible Environment

Compatibility in environment, i.e., communicating with people of similar background, ensures effectiveness of our organizational communication. A common environmental premise for communication develops in organization when both the sender and the receiver of communication are culturally, economically, professionally, demographically and interest-wise alike. For incompatibility in the environment of organizational communication, managers always try to synchronize the premise with goal congruence model. Making the workers understand the threat of globalization and competition would be more effective, when we try to draw them to common interest areas, i.e., we all are at a stake, unless we together try to achieve the best.

## ORGANIZATIONAL COMMUNICATION

Communication is a means by which people are linked together in an organization to achieve a common purpose. No group activity is possible without communication.

In organizations, managers need to be skilled both at his job and communicative ability, since the lack of the latter will not help them to build a proper chain of authority and improve relationship with fellow employees. We must also appreciate that interpersonal communication and organizational communication are different in nature. However, interpersonal communication skill is the base. It helps managers to be able to communicate well in the organization adopting some common frame of reference, assessing individuals and also by building relationships. In all communication, we not only transfer information and also provide behavioural inputs. Hence, organizational communication is considered as a unified activity, making the process productive to achieve some specific goals. Organizational communication provides social inputs into a social (organizational) system, by which managers try to modify the behaviour to effect change. High integrity of the sender and consistency in verbal and non-verbal messages increase the chance of acceptance of communication by the receiver. In organization, internally, managers communicate at different hierarchical levels, groups, departments and, externally, to customers, suppliers and other external stakeholders. In all such communications, managers must be efficient. Oral communication skill is very important for managers. This type of communication is different from the other types. When a manager gives oral presentation, it is important for him to understand the purpose and the audience and then frame the style of delivery.

Thus organizational communication is basically intended to influence action in a positive way, so as to achieve organizational goals. We can list such purposes of organization as under:

- To establish the objectives
- To establish a link between plans and actions
- To organize human resource so that the goals can be achieved
- To create a climate conducive to lead, direct and motivate people
- To enforce effective control

The organizational model has been explained in the following figure:

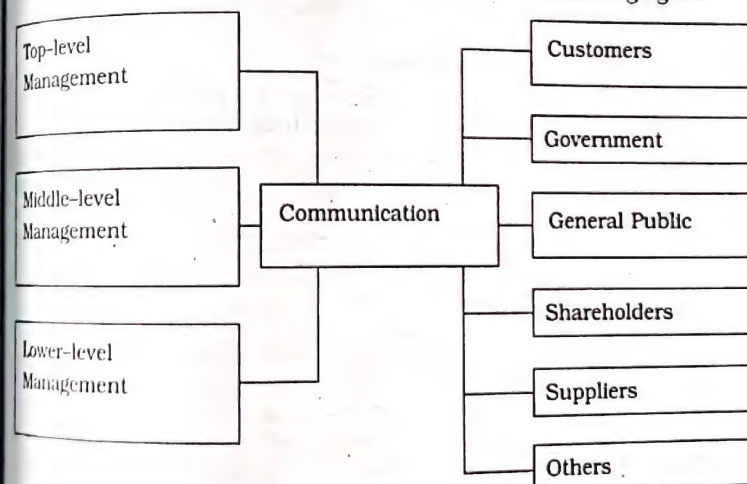


Figure 13.1: Organizational Model

## Types of Organizational Communication

In organization, we make use of various types of communication. Although it is difficult to draw a fine line between organizational communication types, a general understanding at least will enable managers to adopt the right approach. To take an example, a business communication approach is different from a communication, which is intended for team building. Depending on the organizational requirements, managers make use of different types of communication. Such types are:

### Business Communications

It includes all communication, which managers need to do in the business context. Effective business communication requires both the understanding of business and the style of communication. Use of common business English and the style of business correspondence are important requisites. This apart, organizations while doing business communication also require to focus on psychological, sociological, special effects design, management, marketing and information technology aspects.

### Managerial Communications

Managerial communication emphasizes the achievement of specific organizational objectives by adopting suitable communication strategies. To take an example, in disciplining an erring worker, who is otherwise a good performer, may require the organization to develop a warning letter, without hurting the sentiments but arguing logically, to sensitize the conscience of the worker. Similarly, a letter to a payment-defaulting customer, who otherwise had a good track record of meeting payment commitments, requires us to be more strategic in communication.

Organizational communications are made with an established communication networks and the communication flow within an organization, nurturing an organizational climate. Suitable strategy for organizational communication ensures transparency and makes people adaptable to a particular communication culture. It also streamlines communication systems within the organization.

### Human Relations and Team Building

These types of communications in organizations are intended to harmonize interpersonal relations. Interpersonal communications do not limit only with the co-workers; it even extends to customer relations. Hence, effectiveness of this type of communication requires us in understanding the fundamentals of behavioural dynamics of people like, differences in perception, differences in the nature of motivation, common behavioural strategies, establishing rapport, developing mutual respect and reaching consensus.

### Sales Communication

Sales communications are designed to achieve sales objectives and encompass advertising, telephone etiquette, face-to-face communication. Without effective sales communication, organizations cannot improve its top-line. Hence, developing a sales communication that elicits positive response from the target customers is an art. Marketing managers get special training on sales communication to make their efforts more result oriented.

### Report Writing

This type of communication focuses on written reports, more analytic in nature. A company's product literature design, standard operating procedures, policy manuals and customers' information brochures are all developed in report-writing style. Since this report clarifies queries, which may be raised by the users, it has to be written in simple and understandable language.

### Communication Technology and Electronic Communication

It-enabled communication systems or electronic communication mode has drastically changed with the advancement of technology. E-business now facilitates better customer reach, cutting across the national boundary. With the increasing spate of computerization, organizations worldwide now make use of this communication mode to spread their customer reach.

### International Communication

International communication requires customization of communication system of an organization, duly accounting the cultural differences. With globalization, organizations now require to match with the cross-cultural expectations and behaviour of people while entering into verbal and non-verbal communication with their international clients.

The specific communication type that is suitable in a particular case, depends on organizational choice, keeping in view the intent or the purpose. Thus, managers should be professional in their communication, acquiring requisite technical skills; or else, poor communication will cost organization heavily, rendering them inefficient to respond to the needs and expectations of various stakeholders.

## PSYCHOLOGICAL AND BEHAVIOURAL INFLUENCE ON COMMUNICATION

The basic intent of communication is to develop a common understanding. Through communication, we try to develop relationships based on shared mental maps. Shared mental maps follow a structure, and understanding it enriches managers' subjective experience, which they relate with the external reality to trade-off the perceptual incongruence between the sender and the receiver of communications. Perception is the use of senses to construct mental maps, congruent with our beliefs and the environment. Cross-cultural differences of the people make perceptions less than perfect in three different ways, i.e., deletion, distortion and generalization. Deletion occurs due to the limitation of our physical senses. Development of our senses evolves in a natural process through our experience of responding to the environment. This, in a gradual process, develops our beliefs and values, which we use in our communication. To take an example, Douglas McGregor's Theory X and Theory Y, categorizing people as bad or good is the reflection of beliefs and values, which might have developed through the process of deletion.

Like deletion, distortion in communication also takes place due to our inability to observe the external environment correctly. Distortion also alters our perception, as with its influence, we perceive in a way that supports our existing beliefs and values. Attributing a strange flying object as unidentified flying object (UFO) from other planets or attributing the business failure to the luck of CEO is a good example of distortion.

In communication, we use our beliefs based on our perceptions and generalizations. Anything made by TATA is good and by others are questionable, is an example of our generalization-based perception. Our generalization of environment develops through the process of our experience. Like a situational leader, we generalize the environment to decide our style, which yielded results in the past. Some generalizations in communication may be good, whereas, some may be bad.

Therefore, changing communication strategies by an organization may be difficult because of the dynamics of human behaviour. Thus, an effective communication strategy in an organization should match with the mental maps, so that it evokes the desired response.

### GROUP COMMUNICATIONS

In organizations, we communicate individually (interpersonal communication) and also in a group. To manage the business complexity, organizations form groups to pool the knowledge and resources. People in a group solve problems jointly; hence, to coordinate their activities we need to communicate. Exchange of information and communication takes place both between and within the groups. Nature and type of group communication depends largely on the intent or purpose of the group. Communication between and within self-directed groups is different from the communication with a focus group. Whatever we have listed above to indicate the effectiveness of interpersonal communication also applies for group communication. However, non-verbal communication and listening skills are more important for groups.

Communication in small group is task oriented. Unlike most interpersonal communication, communication in a small group is primarily task oriented as small groups are formed to achieve a specific task. In small group communication to make group members to feel comfortable, adopting a blend and motivational approach is very important. This helps in reaching group consensus quickly. Blend approach resolves differences of opinion, whereas, motivation makes members to follow through. Hence, group communication requires special skills of managers, like understanding of group characteristics, group dynamics, specific influence of group members and the role of leadership. Although, we have no specific guidelines for size, type and purpose of small groups, it varies from organizations to organizations. Size of a small group may be anything between two to twenty members, where the goal or purpose remains the same. A strategic group may represent members in the top hierarchy of the organization, whereas, a task group may involve operations people. Hence, communication style varies from one small group to another.

Similarly, groups can be primary, formal or informal. To attain self-satisfaction, the members form primary groups. Informal groups are formed for improving the interpersonal relations, rather than achieving a specific task or objective. Formal groups, however, are formed to achieve a specific goal or objective, i.e., they are more tasks oriented by nature. Again depending on the goals or objectives, formal groups can be informational, education and training, and problem solving. Informational types of formal groups are formed in conference, meetings and briefings. In this type of formal group, communication or information sharing is ensured adopting consistency in approach. Members in such formal groups can

raise questions and participate in discussions. Education and training groups, employee induction, training and development department, facilitate employees' development. Problem-solving groups can either be formal or informal to attain a specific objective.

Depending on the degree of group influence, the style of organizational communication also differs. A strong group influence makes the group members to subscribe to certain assumptions and behavioural norms, which may be either explicit or implicit. The degree of group influence can either result in conformity, resistance, competition and conflict. Although in all cases, managers' role is to communicate in a manner that develops group cohesiveness since, in organizations, intra-group conflict sparks are quite frequent due to competition between them.

With the increased spate of globalization, organizations today require to enhance their competitive advantage developing collaborative capability increasing their spread globally. This requires organizations to revisit their communication strategies, focusing on virtual teams to cope with uncertainty, ambiguity and many cross-cultural issues. The problem further mounts in cross-border mergers and acquisitions. With geographically dispersed virtual teams, communications now largely depend on electronic mediums. The group communication influenced mostly by the cultural practices of the majority may vitiate the ultimate purpose of the groups, as culturally different minority groups may not be able to participate in decision making. To ensure cohesiveness in group communication, which is culturally divergent, therefore, requires an organization to share information and provide opportunity to everyone to contribute their viewpoints. Managers, thus, need to study cross-cultural dynamics to avoid confrontation, misunderstandings and conflict in group communication.

### COMMUNICATION BARRIERS

Communication in organization is one of the biggest challenges today. In an organization, whenever we put two people together in a relationship they each bring divergent values, beliefs, expectations, goals, personality type, communication styles and feelings. Better communication in an organizational relationship is possible only when we recognize these differences and become flexible in accepting and understanding other person's views, opinions or communication style. Otherwise, it creates communication barriers.

Communication barriers, therefore, are the results of several inadequacies that tend to distort the communication and affect the success of the managers in achieving the organizational goals. Important communication barriers can be listed as under:

- Distortion due to superior-subordinate relationship
- Semantic distortion
- Distortion due to premature evaluation by the recipient of communication
- Distortion due to perfunctory attention
- Distortion due to failure to communicate
- Distortion due to resistance to change

Yet in another way, we can classify communication barriers broadly into following categories:

- External Barriers
- Organizational Barriers
- Personal Barriers

Above listed causes of communication barriers can be classified under these three broad heads.

### External Barriers

External barriers can be sub-divided into two types—semantic barriers and psychological or emotional barriers. Semantics is the study of meaning in language. Such barriers are caused in the process of receiving or understanding of the message by coding and decoding ideas and words. In communication, we primarily use words, and each word has several meanings. Therefore, the linguistic capacity of both the communicators and the communicatees may result to misunderstanding. The Oxford English Dictionary mentioned about twenty-five different meanings for 500 most commonly used English words. Similar problems also exist in other languages. Words, therefore, if not properly used may fail to convey real meanings. Semantic barriers may result due to following reasons:

- Badly expressed message
- Faulty translations
- Unqualified assumptions
- Use of technical language

Psychological or emotional barriers are caused in interpersonal communication. Interpretation of meaning in a message largely depends on the psychological and emotional state of the parties involved. Such barriers are due to following reasons:

- Premature evaluation
- Lack of attention
- Loss of information in transmission
- Poor retention
- Lack of reliance
- Distrust of communicator
- Failure to communicate

### Organizational Barriers

This type of barriers is also known as structural barriers. Organizations are designed on the basis of formal hierarchical structure. They are developed to attain certain identified objectives, which require regulation of day-to-day activities by developing performance standards, framing rules, regulations, procedures, policies, behavioural norms, etc. All these affect the free flow of communication in organization, unless they are suitably managed. Superior-subordinate relationships in a formal organizational structure inhibit free flow of communication. Even there are managers who believe in maintaining distance with their subordinates. Communication mostly loses the essence of 'two-way communication'. The reasons for organizational barriers can be listed as follows:

### Hierarchy

Several hierarchical levels may result into the loss of information in transmission, and due to this communication may get delayed or distorted. This particularly happens in upward communication, i.e., communication from subordinates to superiors.

### Status Relationships

Superior-subordinate relationships, due to formal organizational structure, also block the flow of communication due to the status incongruence.

### Functional Specialization

Fragmenting organization in accordance with specialization develops departmental interest and thereby affects the free flow of communication.

### Organizational Policy, Rules and Regulations

These also stand against effective communication within an organization.

### Organizational Facilities

For proper communication among the people in the organization, it requires certain facilities like, meetings, conferences, complaint box, suggestion box, open door system, social and cultural gatherings, etc. Unless such facilities are adequate, communication fails.

### Personal Barriers

Factors internal to communicator and the communicatee, i.e., sender and the receiver, which exert influences on the communication process, are known as personal or interpersonal barriers. Such interpersonal barriers can broadly be categorized into two types, i.e., barriers in superiors and barriers in subordinates.

Superiors act as barriers in communication in following ways:

- **Nurturing of Typical Attitude:** Favourable attitude of superiors foster effective communication, whereas, unfavourable attitude inhibits communication.
- **Fear of Challenge to Authority:** Such fear often compels superiors to withheld information, which dissuade them to effectively communicate.
- **Insistence on Proper Channel:** Superiors often insist on of the flow of communication through appropriate channels, hence blocking the communication.
- **Lack of Confidence in Subordinates:** Superiors often consider the subordinates as less competent. Such perception stand against the free flow of communication.
- **Conscious Avoidance of Communication:** Some superiors have a tendency of ignoring communication consciously, which frustrates subordinates to communicate.

- **Lack of time:** Such belief or reality makes superiors to think that they have no time to talk to their subordinates, which results to the loss of communication between them.
- **Lack of Awareness:** The lack of awareness of superiors about the importance and effectiveness of communication also affects the communication process between superiors and subordinates in an organization.

Subordinates too act as barriers to communication in following ways:

- **Mere Unwillingness to Communicate:** Such unwillingness may be the result of some unpleasant experience from the past.
- **Lack of Incentive:** Prevailing reward and punishment system of the organization is largely responsible for this. If suggestions or any other communication from subordinates do not evoke any response from the superiors, they lose interest in communication.

### Methods of Overcoming Communication Barriers

Effectiveness of communication greatly contributes to the success of an organization and the performance of its managers. Therefore, it is imperative for an organization to improve the free flow of communication overcoming the possible barriers. Some communication barriers cannot be eliminated altogether but at least they can be controlled. To overcome communication barriers, following methods could be followed by any organization:

#### Employee Orientation

If employees are given orientation about organizational objectives, policies, procedures, programmes, authority relations, etc., it minimizes the communication barriers significantly. This apart, employees are required to be communicated about the vision, mission, goals, objectives, strategies and even, if required, they need to be involved in developing the same. Such participation enhances commitment from employees. This transparency on the part of the organization keeps the employees informed about the different issues concerning the organization. Unfortunately, this aspect gets neglected in organization, which culminates into conflict and creates organizational barriers. There are examples of many success stories in the corporate world, where employee orientation could help the organizations to achieve even more than the planned rate of growth. Wal-Mart is an example to emulate. Wal-Mart is the biggest retail mall in the world and has more than 14.5 lakh people working on their pay-roll. It follows the strategy of EDLP, i.e., every day lower price, and even in global economic downturn achieving significant growth rate. It considers their employees as associates and even share with them the strategic information like pricing, inventory-holding costs (when items remain in the store unsold), freight charges, etc. In the process, associates at the retail outlet level get the flexibility of deciding the sale price of the items independently. Wal-Mart emphasizes more on sales volume, rather than per unit profit margin.

#### Improving Interpersonal Relations

Improved interpersonal relations develop mutuality in organizations; employees become cooperative, and they work together for accomplishing the organizational goals. This requires superiors to respect the dignity and authority of their

subordinates, which in turn develops subordinates' trust on superiors. This helps in eliminating issues concerning the status differences. Such an environment in an organization makes it possible for the manager to communicate freely even through their personal contacts and truly make communication a two-way process.

#### Empathetic Listening

Due to the typical managerial attitude, quite often, the upward communication gets greatly distorted. In course of discussions with the subordinates, managers often talk more without allowing the subordinates express their feelings and emotions. Lack of such listening quite obviously creates barriers to communication, as managers evaluate information without getting the free and frank response from subordinates.

#### Using Proper Language

Barriers to communication are often created due to the semantic distortions. This can be avoided using direct, simple and meaningful language in communication. Avoiding technical terms, words with more than one meaning, difficult symbols, etc., makes it possible to eliminate communication barriers.

#### Communication through Actions

Action speaks louder than words. When subordinates communicate and superiors do not act upon the suggestions, it sends a message back, which dissuades future communication. Same thing also happens when superiors differ from what they say. This leads to a situation when subordinates listen and will not act upon. Such barriers, therefore, require to be eliminated through actions and deeds.

#### Judicious Use of Grapevine

Grapevine is important for communication. However, at times when managers depend too much on grapevine, ignoring official channels of communication, it develops a culture of informal communication and thereby creates barriers to communication. Hence, grapevine needs to be judiciously used.

#### Lack of Information Feedback

Communication is essentially a two-way process; hence, feedback is very important. When there is no information feedback, it creates barriers to communication. Even in face-to-face communication, body language may provide a successful feedback.

### TRANSACTIONAL ANALYSIS

Eric Berne (1961) founded the concept of Transactional Analysis'. It is now widely applied in organizational communications. The basic premise of Eric Berne's Transaction Analysis is Sigmund Freud's contribution to human psyche. Berne advocated that during communication, we reflect our state of mind, which translates to child ego, adult ego or parent ego. It is possible for a person to reflect all the three ego states simultaneously while communicating with others. Every ego state carries some different meaning. To take an example, a communication from a child ego may either be destructive or happy. While communicating from the state of destructive child ego, a person reflects his uncompromising attitude, without

listening to the information provided by the others. Such person even can decide to go wrong, even knowing the fact that his decisions would definitely go wrong. In contrast, however, a communication made from the state of happy child ego is more accommodative, reposing confidence to others, stating the things to go on a certain way as it is desired. An adult ego communication being a formal kind of communication between two matured minds, who understand the environment, becomes effective and contributes to the organizational effectiveness. However, adult ego communication can only be possible between two mindsets, which are alike.

Communication from the state of parent ego again can be either critical or nurturing. Critical parent ego communication shows uncompromising attitude and often becomes very unrealistic. Corporate leaders while communicating with their subordinates, often become critical, further damaging the spirit and the morale of the people. Nurturing parent ego communication, however, is understandable, accommodative and more facilitating. Yet in another way, we can define nurturing parent ego as positive or negative (spoiling) and critical parent ego as positive (structuring) or negative. Similarly, the child ego can also be classified as adaptive, which may either be cooperative (positive) or compliant/resistant (negative) and free, which again may be either be spontaneous (positive) or immature (negative). According to Berne, it is important for every manager to understand communication dynamics in the context of transactional analysis.

Parent ego is our ingrained voice of authority, absorbed conditioning, learning and attitudes, which we develop right from our childhood. It is formed by external events and influences, while we grow from our childhood. Child ego develops through our internal reaction and feelings to external events from our childhood. This mental imprint embodies our seeing, hearing and feeling experiences. Adult ego, being the reflection of our matured mind, embodies our experience of dealing with the situation. Thus in a nutshell, we can say parent ego is our taught concept, adult ego is our thought concept while child ego is our taught concept.

Berne (1972) defined ego states as 'coherent systems of thought, feeling, manifested by corresponding patterns of behaviour.' Some authors, however, consider the term body language than behaviour, because behavioural impulses may not be always evident; rather, it is internal-felt experiences. According to Berne, each ego state is a distinct system of interacting feelings, thoughts and potential behaviour. Transactional Analysis is extensively used in organizational development, to develop the right change premise, eliminating dysfunctional organizational behaviours.

Transactional analysis, in another way, can also be defined as language within a language, to reflect the true meaning, feeling and motive of the communicator. It helps us to understand the environment and then decide our choice of ego states, while communicating with others. Due to its all encompassing effects, transactional analysis is used in the theory of personality, communication, understanding behavioural pattern of the people.

As a subject, transaction analysis has developed beyond Berne's original theories. Subsequent to his death in 1970, many of his followers extended the concepts further. Abe Wagner, Vann Joines and Anita Mountain sub-divided three ego states in seven-element model. Refer to Figure 13.2:

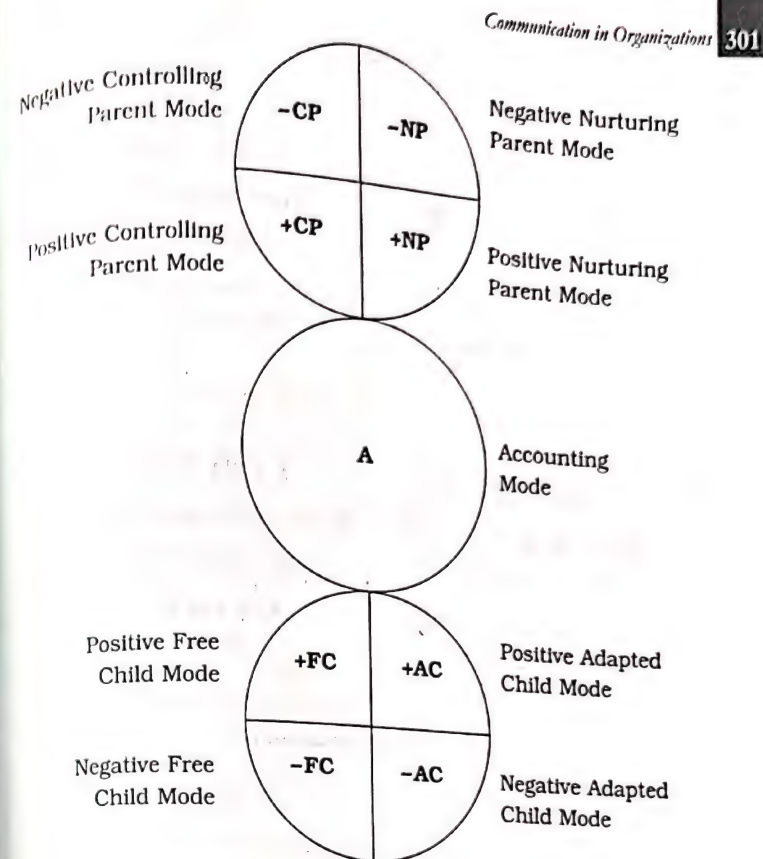


Figure 13.2: Seven Elements of Ego States

#### Parent Ego

Nurturing—Nurturing (positive) and Spoiling (negative).

Controlling—Structuring (positive) and Critical (negative).

#### Adult Ego

Single entity

#### Child Ego

Adapted—Cooperative (positive) and Compliant/Resistant (negative).

Free—Spontaneous (positive) and Immature (negative).

Franklin Ernst (1971) developed the OK Corral Matrix, which we also call Corralogram (Figure 13.3), to draw the life positions in quadrants. Except the I am OK – You are OK situation, rest are not the healthy position.

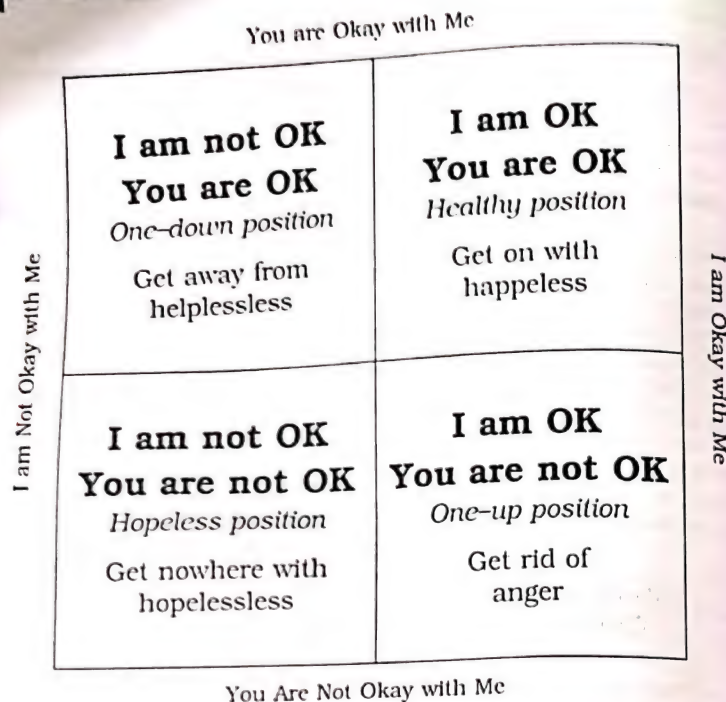


Figure 13.3: Corralogram

### NEGOTIATION

Negotiation is a decision-making process by two parties with opposing interests. In conflict resolution, we use negotiation mostly to settle differences between management and the unions through collective bargaining machinery. We have explained collective bargaining earlier in this book. Here, however, we are more concerned for communication perspectives of negotiation. In any negotiation process, we consider two goals—substantive and relationships.

**Substantive goals** are those which help us to settle some claims, involving either receiving or giving some benefits. A negotiation for wage increase is an example of substantive goal.

**Relationship goals** deal with the outcome of decisions, which put the two negotiating parties to work well subsequent to the negotiation reached. Effective negotiation, therefore, requires resolving the substance issues, while nurturing the harmonious relationships between two negotiating parties. Whatever may be the process for negotiation, we follow two approaches, i.e., distributive approach and integrative approach. Distributive approach is a win-lose or a zero-sum game approach, whereas, the integrative approach is a collaborative approach, where both the negotiating parties try to expand the outcomes of their decisions by sharing the benefits.

Distributive negotiation approach is taken in those cases where negotiating parties intend to settle their differences with mutually exclusive goals. Hence, both the parties intend to withhold as much information as possible and try to obtain maximum information from the other. Therefore, often in distributive negotiation, it becomes difficult to take an informed decision, as the agreement is reached between the parties without adequate information backup. In contrast, in the integrative approach, negotiation parties gain at the expense of the other. Both the negotiating parties work together to optimize the resources in the best possible manner so as to gain mutual benefit. While doing substantive negotiation, we always try to gain tangible benefit, whereas, in integrative negotiation, we try to gain both tangible and intrinsic satisfaction. Hence, in integrative negotiation, negotiating parties adopt supportive attitude, empathy and take informed decisions.

In some negotiation, we also adopt third-party intervention to reach a conclusive settlement. Involvement of arbitrator and mediator is often required in case of organizational conflicts, particularly in wage-related matters.

Thus, negotiation is a process by which two parties seek to reach agreement through bargaining. Win-win negotiation situation is possible when each party is prepared to give up something to achieve something the other party has. In organization, while we negotiate we try to understand the following things step wise.

- Step - 1: What do you want?
- Step - 2: What we can bargain?
- Step - 3: What wants will we agree?

Followed by this, we then list our objectives like, what we intend to get and what we must get. While negotiating we must listen carefully, ask questions, whenever necessary and get clarified whenever we require. Also we try to summarize the discussion. Things that we need to avoid are: argument, interruption and assumption and even expressing our concerns. To make the negotiation effective, we always search for areas of common interests and also make use of the positive body language. Most commonly agreed model of negotiation is—preparing for negotiation (which involves setting of objectives, defining strategy and gathering of data), opening, bargaining and closing.

Every manager needs to negotiate in one area or the others in his/her day-to-day work life. To succeed in negotiation, managers must have analytical ability, empathy, planning ability, interactive skills and communication skills. Such skills can only be developed through experience. Some theoretical understanding may help but putting the learned theories into practice, requires a manager to be a part of negotiation, initially as an extra-member to watch how seniors play their role in negotiation. Negotiation skills of managers help in following important areas:

- Optimization of time, scope, costs and quality
- Managing the change in organization successfully
- Optimizing resource allocation
- Managing contract and vendors
- Managing industrial relations
- Industrial disputes settlement

Negotiation in organization, as has already been introduced, involves interaction between two conflicting groups to reach to a solution acceptable by both the groups. Thus, effective negotiation intends to resolve conflicting situations, striking a win-win solution (acceptable to both the conflicting parties). Depending on the situation, styles of negotiation may differ. For successful negotiation, managers have to prepare beforehand and follow certain well-defined steps as under:

### Understand the Scale of Disagreement

For major disagreements, thorough preparation preferably using worksheet is necessary. For minor disagreement, such thorough preparation is not necessary, as it may turn out to be manipulative. While preparing to negotiate for major disagreements, managers (negotiator) may try to understand the goals, i.e., what we intend to achieve through negotiation, i.e., the extent we can stretch to in terms of accepting the conditions, involving financial benefits or otherwise.

The purpose of negotiation are given as follows:

- Alternatives, i.e., possible ways to reach to a decision, when the original line of action fails
- Relationships, i.e., accounting for history of relationships and how it may impact the negotiation
- Expected outcome, i.e., pre-understanding of possible expectations of people out of negotiation
- Consequences, i.e., pre-analysis of possible consequences (win or loss) of negotiation
- Power, i.e., analysing the power in the relationship, resource control, etc.
- Possible solutions, i.e., understanding of possible solutions

It is important for both the negotiating parties to feel positive, detaching to the extent from the emotional feelings. Managers at the outset, try to unfreeze, to ensure that the negotiating group members feel at ease to break the deadlock. The entire negotiation should be such conducted so that every one commits to the issues of differences and agrees to the line of solution.

### SUMMARY

Communication is the process of interaction, interchange, sharing and common understanding. In business, most of our working time is spent on communication. Communication follows a definite process of involving the sender, receiver, message, channel, feedback and also the situation. Communication essentially follows a two-way channel. In all managerial functions, communication plays the most important role. It serves the function of information, command and instructions, influence and persuasion and also the function of integration. There are certain barriers to communication. Organization has to control such barriers for more productive and efficient use of communication.

We still have many differences of opinions about the term 'communication', more specifically, about the usage of the word as *communication* or *communications*. Hence, managers need to understand the contextual

differences. The plural of communication refers to a system for communication, or a system of routes. Communication, per se is a process through which we exchange information between individuals, using some system, symbols or behaviour. The total process of communication attempts to activate human senses. Thus, perceptual congruity between the sender and the receiver is very important to get the desired result through communication in organizations.

### Key Words

**Verbal Communication:** Verbal communication is the use of words and languages for interaction between two or more individuals. It can either be oral or written. In organization, this type of communication is extensively used.

**Non-Verbal Communication:** Non-verbal communication occurs without the use of words. It sensitizes our senses, and thereby evokes responses, depending on the way we interpret a particular cue. It is often referred to as body language, i.e., any non-flexile or reflexile body movement of the communicator which carries some meaning.

**External Communication:** It takes place between two organizations, that is, between the organizations and others outside the organizations.

**Downward Communication:** Downward communication is between the superiors and subordinates. Here the superiors communicate with the subordinates.

**Upward Communication:** It is the communication between the subordinates and the superiors. Here subordinates communicate with the superiors.

**Horizontal Communication:** Horizontal communication takes place between two equals, that is, between persons working at the same level in organizations.

**Diagonal Communication:** Diagonal communication takes place cutting across the hierarchical barriers. A communication between a chairman of a company and a worker can be categorized as diagonal communication.

**Human Relations and Team Building:** This type of communications harmonizes interpersonal relations. It extends even to customer relations. Effectiveness of this type of communication requires good understanding of the fundamentals of behavioural dynamics of people, such as, differences in perception, differences in the nature of motivation, common behavioural strategies, establishing rapport, developing mutual respect and reaching consensus, etc.

**Sales Communication:** Sales communications are designed to achieve sales objectives and encompass advertising, telephone etiquette, and face-to-face communication, etc.

**International Communication:** This requires customization of communication systems of organizations, duly accounting for the cultural differences. With globalization, organizations now require to account for the cross-cultural expectations and behaviour of the people.

### REVIEW QUESTIONS

1. Define the term communication and list out its important characteristics.
2. Explain the process of communication.
3. What is two-way communication channel? What are its features?
4. List out important objectives of communication.

5. Describe essential elements of business communication.
6. What are the important features of communication?
7. What are the different types of communication? Explain their relative merits and demerits.
8. Discuss what are the barriers to communication in an organization? How do they affect organizational efficiency?
9. How can we overcome barriers to communication?
10. Short Notes:
  - (a) Formal and Informal Communication
  - (b) Verbal and Non-Verbal Communication
  - (c) Upward and Downward Communication
  - (d) Horizontal and Diagonal Communication
  - (e) Grapevine
  - (f) Body Language

## REFERENCES

1. Berne, E. 1964. *Games People Play*. New York: Grove Press.
2. Berne, E. 1972. *What Do You Say After You Say Hello?* New York: Grove Press.
3. Bhattacharyya, Dipak. Kumar. 2006. *Human Resource Management*, 2nd Edition. New Delhi: Excel Books.
4. Bhattacharyya, Dipak Kumar. 2009. *Organizational Behaviour— Concepts and Applications*. New Delhi: Oxford University Press.
5. Ernst, Franklin. 1971. 'The OK Corral: The Grid for Get-On-With,' *Transactional Analysis Journal* 1(4): 231.
6. Novey, T. 2002. 'Measuring the effectiveness of transactional analysis. An international study', *Transactional Analysis Journal* 32: 8-24
7. Usunier, J.C. 1998. *International and Cross-Cultural Management Research*. London: Sage.

# 14 Industrial Relations (IR) and Labour Welfare

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand industrial relations and labour welfare concepts and issues
- know the theories of industrial relations
- familiar with Labour Laws and Acts
- comprehend discipline issues
- understand the roles of trade unions in the changing economy
- know the process of collective bargaining

## INTRODUCTION

Industrial relation (IR) is an interdisciplinary behavioural science that focuses on the study of people in the workplace. IR practices regulate employer-employee relations, i.e., relationship between management and individual or group of employees. IR covers wide spectrum of human resource management activities, like—the nature of work, management of human resources, nature of labour-union management in organizations, workers' motivation and behaviour, impact of government policies and regulations on workers and the organizations, demand and supply of labour and finally decisions on wage or compensation design and administration.

Although we have number of theories on IR, which in one way or other help organizations to develop the framework of IR in workplaces, we can classify those in following two broad areas:

- Political
- Apolitical

*Political theories* focus on macro-level issues concerning political-economic purpose of society like, class characteristics of the state, conflict between the classes, the exploitative element of

economic and industrial structures and systems, issues concerning ownership, role of working class, political power, etc.

Apolitical theories on the other hand are concerned with inter-organizational questions at the strategic, functional and operational levels of the firm or the industry. All procedural issues like laws and rules regulating work are covered under this category.

Industrial relations depend on a number of factors. Macro-level industrial relations depend on factors like, labour market reforms, unemployment and poverty, national development priorities and international standards. Micro-level industrial relations, on the other hand, depend on factors like, works organization, skills formation, compensation, workplace governance, etc.

Labour welfare is defined as the work for improving the health, safety, general well being and industrial efficiency of the workers beyond the minimum standards laid down by various acts and legislations. International Labour Organization (ILO) defined labour welfare as 'Workers' welfare ... such services, facilities and amenities which may be established in or in the vicinity of an undertaking to enable the persons employed in them to perform in healthy, congenial surroundings and provided with amenities conducive to good health and high morale.' Some labour welfare measures in our country are statutory like, Factories Act, 1948, which requires employers to abide by the provisions of various welfare activities, while some other are voluntary. It can also be classified as intramural and extramural.

*Intramural measures* include those welfare activities, which ensure better quality of work like, scientific selection, training, good work environment, prevention of accidents, canteens, restrooms and refreshments, etc. Intramural welfare amenities are provided within the precincts of the establishment like latrines and urinals, washing and bathing facilities, crèches, rest rooms, canteens, drinking water arrangements, protective clothing, occupational safety, shift allowances, etc.

*Extramural welfare amenities*, on the other hand, are those which are made available outside the establishment like, maternity benefits, social insurance measures, gratuity, pension, provident fund, medical facilities, family planning, children education, housing facilities, recreational facilities, holiday homes, leave travel facilities, cooperative stores, etc. It is important to understand that all are not statutory in nature. However, for better employee relations, companies provide as much facilities as possible. Extramural measures indirectly affect the quality of work life.

### INDUSTRIAL RELATIONS AND LABOUR WELFARE IN INDIA

Labour legislation in India can be traced back to 1850s with the enactment of Apprentices Act. This Act was initially intended for destitute children to enable them to develop their skill base and get a job when they grow up. This was followed by the Fatal Accidents Act, 1855, Employers and Workmen (Disputes) Act, 1860, Factories Act, Mines Act, Plantation Labour Act and series of other legislations. Labour is a common central and the state subject. The Constitution of India [Article 246/4] empowers both the Central and the state governments to legislate on issues related to labour. These issues are varied and are related to trade unions, industrial disputes, social security, social insurance, employment and unemployment and other welfare-related issues covering working conditions,

provident funds, pensions, maternity leave and benefits, workmen's compensation, etc. The state governments are empowered to change and modify labour laws enacted by the Central Government, considering the specific issues and conditions of labour prevailing in the states.

As an IIR manager, one has to understand the basics of relevant labour laws, so as to ensure that no decisions are taken in contravention of the prevailing norms, which may otherwise become a subject of adjudication.

### LABOUR LAWS AND ACTS

For our purpose, we have discussed only some basic objectives of important labour laws governing industrial relations and labour welfare.

#### Factories Act, 1948

This Act is divided into twelve chapters covering 141 sections, which again are supplemented by three schedules. The first Act was enacted in 1881 to regulate working conditions in factories primarily for women and children and to provide them health and safety measures. In 1911, the new Factories Act was enacted, replacing the old one and covering also the hours of work for adults. The Act was further improvised in 1934, incorporating recommendations of the Royal Commission of Labour. The new Act of 1948 replaced the earlier one and through series of amendments made time to time, the Act is now more comprehensive covering all areas of working conditions of labour.

The main objectives of the Factories Act are two-fold. Firstly, it regulates working conditions in factories and secondly, it ensures fulfilment of basic safety requirements, health and welfare and also regulates working hours, leave, holidays, overtime, employment, etc. The scope of the Act extends to all factories in India. Section 2 (m) of the Act defines factories as 'any premises where manufacturing process is carried out using power and which employs ten or more workers on any day of the preceding twelve months. In cases where power is not used, such number would be twenty or more'.

Under the Factories Act, employers have following obligations:

- Compulsory approval from the state government or the chief inspector of factories
- Sending the notice of registration/license to the chief inspector of factories within seven days from the date of his taking over the charge
- Conform to general duties concerning health, safety and welfare of workers
- Conform to general duties regarding articles and substances for use in factories
- Provide required health measures
- Undertake safety measure
- Provide stipulated welfare measures, degree of which varies with the number of workmen employed
- Conform to stipulations on working hours, holidays and overtime
- Conform to provisions concerning leave and wages
- Display notices, maintain registers and submit returns

- Send notices on accidents, dangerous occurrences and diseases
- Fulfill obligations regarding hazardous process/substances

Factories Act also provides for certain obligations of employees, rights of employees and employers and penalties for offences.

Every HR manager must know the basic tenets of the Act to guard against any decision, which may not be tenable.

### Industrial Disputes Act, 1947

This Act primarily regulates industrial relations in India. The Act provides machinery and procedure for settlement of industrial disputes by negotiation, without resorting to strikes and lockouts. The scope of the Act extends to the whole of India for every industrial establishment carrying on any business or trade, irrespective of the number of people employed. However, the Act is not applicable for people employed in managerial or administrative capacity and also not for those who are employed in Army, Air Force and Navy, Police Services and Prison Services. The Act defines industrial dispute as any dispute or difference between employers and employees or between workmen and workmen, which is connected with the employment or non-employment or the terms and conditions of employment. A tentative list of disputes covered under this Act is reproduced below:

- The propriety or legality of standing orders
- Discharge or dismissal
- Matters pertaining to reinstatement or grant of relief for wrongful dismissal
- Matters pertaining to withdrawal of any concession or privilege
- Matters pertaining to strike or lockout
- Payment of wages, including periodicity and mode of payment
- Leave and hours of work
- Holidays
- Bonus
- Retirement benefits
- Discipline
- Non-implementation of award, etc.

Labour Bureau, Shimla has classified the disputes under several heads indicating their incidences on total disputes in percentage terms. HR manager has to comply with the laid down obligations under the Act, which broadly covers service conditions, constitution of works committee, implementation of agreements, settlements and awards, avoidance of illegal lockout and non-indulgence in unfair labour practices.

### The Industrial Employment (Standing Orders) Act, 1946

This Act requires employers to clarify conditions of employment so as to enable the workmen (employed by them) to understand the rules of conduct pertaining to working hours, holidays, attendance, leave, termination of employment, suspension or dismissal, misconduct, etc. The Act is applicable for industrial establishments, employing 100 or more workmen. Under this Act, employers are required to submit

draft standing orders to the certifying officer for certification. Upon certification, the draft standing order receives the force of law, and employers are required to display the text in the language of the workmen and in English prominently. Once certified, employers cannot modify the standing orders without the approval of the certifying officer. Model standing orders cover following areas:

- Basis of classification of workman—permanent, probationers, temporary, casual, apprentices, badlts
- Information on working time
- Information holidays and paydays
- Wage rates
- Shift work
- Attendance and late coming
- Leave
- Payment of wages
- Stoppage of work
- Termination of employment
- Act of misconduct, which is liable for disciplinary action, etc.

Standing orders are guidelines for HR decisions; hence, HR managers must know legal interpretation of standing orders.

### The Trade Unions Act, 1926

Trade unions are primarily formed to regulate the relations between workmen and employers. The Act provides for registration of trade unions, which also includes association of employers. Upon registration, trade unions enjoy certain protection and privileges under the law. In addition, the Act also provides for imposing restrictions on the conduct of any trade or business. Although, registration of a trade union is not mandatory, it is always desirable to get a trade union registered since, a registered trade union enjoys certain rights and privileges as per the Act. The Act requires that at least 50 per cent of the trade union's office bearers should actually be engaged or employed in the industry. The term 'industry' here actually indicates the organization. A registered trade union becomes a body corporate with the perpetual legal entity under a common seal. Like any other body corporate, it can acquire, hold, sell or transfer any movable and immovable property and can also be a party to any contract. It can sue and even can be sued in its own name.

### Trade Unions (Amendment) Act, 2001

The Trade Unions Act, 1926 provides for the registration of trade unions of employers and workers and in certain respects, it defines the law relating to registered trade unions. It confers legal and corporate status on registered trade unions. The Act is administered by the concerned state governments. Certain provisions of the Act were amended and given effect to w.e.f. 9.1.2002.

Some of the salient features of the Trade Unions (Amendment) Act, 2001 are:

- (a) No trade union shall be registered, unless at least 10 per cent or 100, whichever is less, subject to a minimum of seven workmen, engaged or

employed in the establishment or industry with which the trade union is connected, are the members of such trade union on the date of making of application for registration.

- (b) A registered trade union of workmen shall at all times continue to have not less than 10 per cent or 100 of the workmen, whichever is less, subject to a minimum of seven persons engaged or employed in the establishment or industry with which the union is connected, as its members.
- (c) A provision for filing an appeal before the Industrial Tribunal/Labour Court in case of non-registration/restoration of registration has been provided.
- (d) All office bearers of a registered trade union, except not more than one-third of the total number of office bearers or five, whichever is less, shall be persons actually engaged or employed in the establishment or industry with which the trade union is connected.
- (e) The minimum rate of subscription by members of the trade union is fixed at one rupee per annum for rural workers, three rupees per annum for workers in other unorganized sectors and twelve rupees per annum in all other cases. For the promotion of civil and political interest of its members, unions are authorized to set up separate political funds.

### The Minimum Wages Act, 1948

The Act provides for the minimum statutory wages for scheduled employments. The Act also stipulates the maximum daily working hours, weekly rest and overtime. It prevails over the rates fixed under any award agreement. The Act empowers the state government to fix minimum wages, failing which they cease the right to engage labour and run the industry. Wages, as per the Act, include all remuneration capable of being expressed in terms of money including the house rent allowance. However, it excludes the value of housing accommodation, supply of light, water, medical attendance, employer's contribution to provident fund and pension fund, travelling allowances or the value of travelling concession, gratuity payable on discharge or any other payments made to defray special expenses. For HR managers, it is important to consider all these aspects while designing compensation package.

### The Payment of Wages Act, 1936

The Act is intended to regulate payment of wages in a particular form at regular intervals without any unauthorized deductions. It is applicable to the employees receiving wages below Rs1600 per month. As per the Act, employers are responsible for the payment of wages to the employees, duly fixing the wage periods (which in no case should exceed one month) and deciding about the time of payment as per the norms, which require payment within seven days of the expiry of the wage period for establishment where less than 1000 people are employed and in other cases within ten days of the expiry of wage period. Employers are also responsible of the mode of payment (in cash or by cheque or by crediting to the employee's bank account with his prior consent). Employers also need to ensure that there are no unauthorized deductions. All these aspects must be known to the HR manager.

### The Payment of Bonus Act, 1965

The Act imposes statutory liability on employers (covered under the Act) to pay bonus to employees according to the prescribed formula, linking the bonus with profits or productivity. Bonus is payable to every employee receiving salary or wages up to Rs 3500 per month, provided the employee has worked at least for thirty days in that year, save and except those employees who have been dismissed from the service for fraud, riotous or violent behaviour or theft, misappropriation or sabotage of any property of the establishment. Such employees cease the right to get bonus even for the previous unpaid years. Irrespective of the fact that they have committed such acts in the present year. Employers can deduct from the bonus any customary payment made to the employees (festival or interim bonus) earlier. Employers can also recover any financial loss caused for the misconduct of the employees.

### The Employees' Provident Funds and Miscellaneous Provisions Act, 1952

The Act provides for compulsory contributory fund for social security of the employees and their dependents (in case of death). It extends to every factory or establishment employing twenty or more persons. The Central Government, however, by notification, bring any establishment under the purview of the Act even in cases where such establishments employ less than twenty persons. However, cooperative society employing less than fifty persons and working without the aid of power, newly set-up establishments (for initial three years) and state/Central Government establishments (where they have their own schemes) are immune from the provisions of this Act. The Central Government has framed three schemes under the Act, i.e. Employees' Provident Fund Scheme, 1952 (for provident funds), Employees' Family Pension Scheme, 1971 for providing family pension and life assurance benefit, which since been merged with, Employees' Pension Schemes, 1995 and the Employees' Deposit Linked Insurance Scheme, 1976. The Act requires employers to contribute an amount at 12 per cent of the wages, daily allowances, etc., (10 per cent in case of BIFR-referred establishments or establishments employing less than twenty persons or any establishments in the jute, beedi, brick, coir and gum industries) and ensure similar deduction from employees. They have to the same together with administrative charges and required returns/attachments to the regional provident fund office or to their own private provident fund scheme (approved by the provident fund commissioner).

### The Payment of Gratuity Act, 1972

This Act is also a social security measure to provide retirement benefit to the workmen, who have rendered long and unblemished service to the employer. Employees are entitled to receive gratuity under the Act, provided they have rendered continuous five years service or more at the rate of fifteen days' wages for each completed year, subject to a maximum of Rs 3,50,000. The gratuity may be wholly or partly forfeited by the employer if termination of services of an employee is due to his riotous or disorderly conduct or any other act of violence or any offence, including moral turpitude committed in the course of his employment.

In addition to the above Acts, HR managers are also required to understand basics of the Workmen's Compensation Act, 1923, The Employees' State Insurance Act, 1948, The Apprentices Act, 1961, The Contract Labour (Regulations and Abolition) Act, 1970, The Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959, The Equal Remuneration Act, 1976, The Maternity Benefit Act, 1961, Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 or Acts related to the nature of industry, where they are employed.

Even though, present HR functions have now come a long way from mechanical compliance with various Acts to proactive human relations functions, it is always advisable to understand these basics, to ensure HR managers are not risking their decision, contravening the provisions.

These apart, there are many other acts, governing industrial relations and labour welfare in India. Some of those are as under:

### **Shops and Establishment Act**

This Act is a state legislation and is intended to regulate the working conditions of workers in the unorganized sector, including the shops and establishments, which do not come under the purview of the Factories Act. The Act has laid down the regulations relating to the working hours, rest intervals, overtime, holidays, termination of service, maintenance of shops and establishments and various other rights and obligations of the employers and the employees.

### **Maternity Benefits Act**

This Act was enacted to provide maternity benefits to women employees. The Act provides for a leave of three months with full salary before or after the birth of child of women employees. However, as per the new provisions, such leave can even be extended up to six months and also up to two children.

### **Workman's Compensation Act**

As per this Act, workers and/or their dependents can get relief in the event of any accidents arising out of or in the course of employment, causing death or disability of the workers.

### **Group Insurance**

This is known as public liability insurance and is based on the principle of strict liability. For installations that handle hazardous substances, it is now mandatory to provide insurance coverage, so as to ensure minimum relief to the victims. To make the provisions for insurance coverage, every owner is now required to take a policy for an amount not less than the paid-up capital or the market value of assets and stocks. The owner has also the obligation to contribute an equal amount of premium to an environmental relief fund. A newly set-up company enjoys exemption from the Employee's Provident Fund and Miscellaneous Provisions Act for the initial three years of its operation.

Other amenities like, canteens, rest shelters, first-aid centres, crèches, educational and recreation centres are also required to be provided by the employers in factories, mines and plantations.

## **Social Benefits Coverage**

All social benefits are available to a worker irrespective of nationality. Foreign nationals employed in India at a relatively high level salary may not be covered by the Act, depending on their terms of employment.

### **Environment Act**

This provides a framework for the Central Government to coordinate environment-related activities of the Central and State authorities. Limits on industries' effluent and emission discharges have been prescribed. Boards constituted under these Acts are empowered to make an application to the court to restrain the potential pollution of air, water or land and also to take emergency measures in case of actual pollution. Under the environment law discussed above, penalties of both fine and imprisonment, which are very high, may be enforced for the contravention of the Act.

Some of the recent amendments of important Acts have been discussed here in brief to understand the process of changes in industrial relations and labour welfare in India.

### **Other Mandatory Acts**

In addition to the employees, direct benefits fund Acts mentioned above, other Acts constituted in India are the Water (Prevention & Control of Pollution) Act and the Water Cess Act, Air (Prevention & Control of Pollution) Act, and Forest Conservation Act (concerned with the pollution and improvement of the environment).

## **TRADE UNIONS**

Trade unions are voluntary organizations of workers. Through joint action, they protect and promote the interest of workers. With the setting up of large-scale industrial units, a new class of workers, dependent solely on wages for their livelihood, has emerged in India. In the absence of collective action, this working class had to be satisfied with wages, which they could individually negotiate with the employers. In such a circumstance, individual workers had virtually no bargaining power, perhaps for reasons of abundant supply of labour. Hence, the need for joint action at least to sustain, if not to improve, their bargaining power against the employers had been strongly felt. The pace of such action has been accentuated with the recognition by the community to form unions to institutionalize workers' rights to organize, to press for their demand collectively and to go for strike when their claims are not accepted.

### **History**

The earliest known trade unions in India are:

- (a) The Bombay Mill Hands' Association, was formed in 1890 for the purpose of urging the government of improvements in factory law. However, it soon became defunct after the passing of the 1891 Act.
- (b) The Amalgamated Society of Railway Servants of India and Burma was formed in 1897 by Anglo-Indians and domiciled Europeans employed on

railways. This, however, was more of a friendly association than to secure concessions.

- (c) Printers' Union started in Calcutta in 1905
- (d) The Bombay Postal Union was formed in 1907
- (e) The Kamgar Hitwardhak Sabha, was formed in Mumbai in 1910. This was a body of social workers and not workers of the organization. They were interested in general welfare of labour.

In the decade following the end of First World War, India witnessed rapid developments in the field of trade unionism. These were the beginning of the Trade Union Movement in India. Within a period of five years (1919-1923) several unions were formed in different parts of the country. The movement initially had made an inroad in the Railways, in Postal and Telegraph Department, among seamen and in the Textile Industry in Ahmedabad city and also in some other centres.

Although individual unions were well accepted by the society almost since their stage of formation, employers in majority of the cases refused to recognize the unions on the plea that union executives consisted of outsiders. Workers interested in trade union activities were victimized by the employers. To thwart the Trade Union Movement, the then employers succeeded to get an amendment passed in the Indian Penal Code in 1913, declaring trade unions as illegal bodies. The Buckingham & Carnatic Mills case of 1921 in Madras High Court, granting an interim injunction against the Madras Labour Union, further added to this fuel. At this point of time, trade union leaders suddenly found that they are liable to prosecution and imprisonment even for bona fide trade union activities. In March, 1921, the legislative assembly of the Government of India, on the motion of Late N.M. Joshi, the then General Secretary of the All India Trade Union Congress (AITUC), passed a resolution for the registration and protection of Trade Unions. Since then, the pace of the Indian Trade Union Movement continued unabatedly and reached its height during 1928-29, when communists wooed the world of Indian Labour.

After World War II and independence of the country in 1947, political considerations led to the division of trade union leadership. In 1947, Indian National Trade Union Congress (INTUC) was formed. The differences with the socialist workers inside AITUC, led to the formation of Hind Mazdoor Sabha and subsequently to the Central Indian Trade Union Congress (CITU), representing the leftists. The socialists under the leadership of Dr Ram Manohar Lohia formed the Hind Mazdoor Panchayat and the Jan Sangh set up the Bhartiya Mazdoor Sangh. Since then four more Central Trade Union Organizations have been formed to accelerate the pace of Indian Trade Union Movement.

Trade unions in India are associated mainly with the two international trade union federations, viz, the World Federation of Trade Unions (WFTU) and the International Confederation of Free Trade Unions (ICTU).

In matters of industrial reactions and workers' productivity, trade unions play a crucial role. Relative strength of any particular union is determined from its membership details.

Number of registered unions (workers and employees) and their respective membership, verified from returns submitted by them for the year 1986 to 1996 are presented in the following table:

Year	Number of Registered Trade Unions (E)	Number of Unions Submitting Returns	Membership of Unions Submitting Returns (In thousands)			Average Membership per Unions Submitting Returns
			Men	Women	Total	
1	2	3	4	5	6	7
1986	48,030	11,365 (39.6)	7370 (90.0)	820 (10.0)	8190	721
1987	49,329	11,063 (36.9)	7211 (90.6)	748 (9.4)	7959	719
1988	50,048	8730	6334	739	7073	810
1989	52,210	9758	8207	1088	9295	953
1990	52,016	8828 (46.4)	6181 (88.1)	838 (11.9)	7019	795
1991	53,535	8418 (36.8)	5507 (90.3)	594	6100	725
1992	55,680	9165	5148	598	5746	627
1993	55,784	6806 (26.3)	2636 (84.1)	498 (15.9)	3134	460
1994	56,872	6277 (25.3)	3239 (79.1)	855 (20.9)	4094	652
1995 (P)	57,952	8162 (24.6)	5675 (86.8)	863 (13.2)	6538	801
1996 (P)	58,805	7309 (20.4)	4,259 (75.9)	1,354 (24.1)	5,613	768

Source: Indian Labour Year Book, 1998

Note: E denotes 'Estimated'; P denotes 'Provisional'

It is evident from the table percentage of registered unions submitting returns, over the years, have declined considerably. This also indicates dwindling trade union activities in the country.

Beginning from 1928-29 till 1970s, trade unions in India reached a commanding height. Almost all public sector units (PSUs) and major private sector organizations by this time have been unionized. However, since early 1980s, we have seen the declining phase of trade unions in India. In fact, from this period onwards, the industrial restructuring process began in India.

With the announcement of new economic policy of the Government of India in 1991 labour institutions and trade unions in India are now facing a challenging task ahead. The new economic policy poses following challenges to the trade unions:

1. Gradual shift of employment from the organized sector to unorganized sector. Out of the total labour force of 317 million in the country, the organized sector employs merely 26.8 million, i.e., only 8.5 per cent. Such shift in employment is a major phenomenal trend during the post-industrial restructuring process (began in 1980s). This trend obviously gives employers of the unorganized sector the advantage to flout labour laws.
2. The increasing emphasis on exports and the emergence of free trade zones (FTZ) or export processing zones (EPZ) in different parts of the country is again a major source of threat to the trade unions as such units get the advantage to immune them from the labour laws.
3. The growth of employment over the last few years has severely affected the industrial restructuring process. Added to this, is the burden of a huge number of unemployment, and nearly four million people from the organized sector are likely to lose their employment in the process of structural adjustment programme.
4. Closure of sick industrial units, which employ forty-five lakhs of people, sooner or later, will further add to the burden of unemployment. Government of India even though initiated to provide safety net under the Voluntary Retirement Scheme (VRS) so that the workers get some benefits, if they lose their jobs, is, in reality, yet to come out with any concrete proposal (except mooting of the idea). In a national level seminar organized by the Indian Society of Labour Economics during 1992, the Department of Industries closely circulated a paper on proposed VRS, giving the details of the government's resolution on such count taken during February 1992. However, the said scheme is yet to be implemented, excepting in some select PSUs, who are going for disinvestment, and a few private sector organizations. In both the cases, NRF money, which are primarily for helping organizations to withstand the pressure of liberalization (by technological changes), are being unduly used, without any governmental intervention. Even there are wide variations in the VRS modalities. Only recently, government has proposed VRS in departmental undertakings.
5. To keep pace with the global competition accentuated by the market globalization programme (an outcome of economic liberalization policy), Indian industries are now required to introduce new technology. In industrial units, conventional machines are now being replaced by Numerically Controlled (NC), Computer Numerically Controlled (CNC), Direct Numerically Controlled (DNC) Machines, Flexible Manufacturing System (FMS), etc. Such introduction of new technology is now making the traditional skills redundant, which necessitates redeployment of the workers after giving them suitable training or the replacement of the workers (who cannot be retrained) by the new workforce. This new workforce being educated and skilled is mostly inducted in managerial or supervisory grades, resulting in the reduction in employment of workers. In addition, new technology, being more systematic, enables the management to have greater control over the labour process. All these, therefore, severely erode the powers of the unions.

It is evident from the analysis of industrial disputes over the last few years that lockouts are more responsible for loss of man-days. This clearly indicates that the power of unions has reduced to influence the employment relations in the industrial units. The fact that the trade unions are losing their powers is evident from the fact that in many units, enterprise-level unions are emerging. Such enterprise-level unions are internal or independent unions having no political affiliation. Hence, in the context of the present scenario, it is expected that trade unions in India will have to make them more transparent and responsible to survive in the coming years.

Readers may refer to the table on the next page for the all-India data of the number of units who practised lay-off and the number of workers laid off in a span of five years from 1987 to 1992.

The following table gives us the cause-wise data of the number of units, which practised downsizing and the number of workers laid off in India in the span of five years from 1987 to 1992.

Cause-Wise Number of Units Effecting Retrenchment and Workers Retrenched during 1987-92

	1987		1988		1989		1990		1991		1992	
	U	W	U	W	U	W	U	W	U	W	U	W
Financial Stringency	50	618	60	687	32	529	77	958	40	611	29	1632
Shortage of Raw Materials	21	470	17	320	14	192	14	318	11	173	4	83
Shortage of Power	2	29	2	237	3	20	2	16	0	0	1	16
Breakdown of Machinery	0	0	1	33	1	13	0	0	2	9	1	10
Lack of Demand	149	1210	186	1957	69	518	100	1073	100	1345	97	810
Off Season	103	2566	101	1607	50	1962	69	615	69	2035	40	711
Not known	29	267	12	173	5	24	5	55	13	223	3	16
Total	356	5202	379	5014	174	3258	268	3037	235	4369	175	3338

Source: Labour Bureau, Shimla

Note: U = Units, W = Workers, P = Provisional

Data of 1992 is from January - November

**No. of Units Effecting Lay-off and Workers Laid off for Different Causes during 1987-92**

Cause	1987		1988		1989		1990		1991		1992	
	Units	Workers	Units	Workers	Units	Workers	Units	Workers	Units	Workers	Units	Workers
Shortage of power	333	1,00,593	225	60,727	206	41,283	178	35,933	131	28,661	166	60,187
Shortage of raw material	128	14,533	123	15,856	141	13,076	107	8,246	127	18,854	72	12,882
Breakdown of machinery	47	4246	35	4466	31	2882	27	1576	29	3577	40	6221
Lack of demand	113	8800	103	3859	76	2929	63	1817	82	3157	60	2391
Financial stringency	35	8524	38	6025	36	3973	24	2771	36	2235	16	3973
Off season	0	0	1	78	1	19	1	10	0	0	0	0
Others	53	8229	52	14,098	47	6491	42	13,718	56	14,576	54	10,261
<b>Total</b>	<b>709</b>	<b>1,44,925</b>	<b>577</b>	<b>1,05,109</b>	<b>538</b>	<b>70,653</b>	<b>442</b>	<b>64,080</b>	<b>461</b>	<b>71,060</b>	<b>408</b>	<b>95,915</b>

Source: Labour Bureau, Shimla

The following table gives an all-India level data on the distribution of strikes and lockouts for different causes over the span of five years from 1987-92.

Causes	1987		1988		1989		1990		1991		1992	
	S	L	S	L	S	L	S	L	S	L	S	L
Wages and Allowances	423	61	413	60	391	34	406	36	367	68	167	44
Bonus	94	41	83	34	92	16	64	8	58	12	9	10
Personnel	209	27	202	27	274	26	225	11	212	58	65	29
Retrenchment	61	3	58	1	36	3	46	8	35	4	9	3
Leave & Hours of Work	18	4	17	11	18	3	26	1	50	2	5	9
Indiscipline and violence	62	184	72	196	100	175	114	171	111	223	29	165
Others	447	122	424	101	446	112	552	107	456	151	192	96
Not Known	34	9	35	11	40	20	30	24	24	40	11	8

Source: Labour Bureau, Shimla

Notes: S = Strikes, L = Lockouts, P = Provisional 1992 data is up to November

### Membership of Central Trade Unions

Central trade unions are those, which operate at the apex level and affiliate the organization or unit level unions. Globally, over the years, memberships of trade unions are declining. India is also no exception. Availability of information on the membership of trade unions is not regular in our country. It is for this reason, in table below, we could present a trend of trade unions' membership in two decades, i.e., 80s and 90s.

#### Membership of Central Trade Unions

S. No.	Name of Trade Union	Membership as on 31.12.1980	Membership as on 31.12.1989
1.	INTUC	22,36,128	26,92,388
2.	BMS	12,11,345	31,16,564
3.	HMS	7,62,882	14,80,963
4.	UTUC(LS)	6,21,359	8,43,256
5.	NLO	2,46,540	1,38,877
6.	UTUC	1,65,614	5,84,523
7.	TUCC	1,23,048	2,30,139
8.	NFITU	84,123	5,29,762

(Continued)

S. No.	Name of Trade Union	Membership as on 31.12.1980	Membership as on 31.12.1989
9.	AITUC	3,44,746	9,38,486
10.	CITU	3,31,031	17,75,220
11.	HMKP	-	3,516
12.	IFFTU	-	428
	<b>TOTAL</b>	<b>61,26,816</b>	<b>1,23,34,142</b>

Source: Various issues of Indian Labour Journals

### Criteria for Recognition of Trade Unions

Following criteria have been laid down in the Trade Unions (Amendment) Act, 2001:

- Where there is more than one union, the union claiming recognition would need to have already functioned for at least one year after its registration. In case, there is only one union, this condition would not apply.
- The membership of the union should cover at least 15 per cent of the workers in the establishment concerned. Membership would be counted only of those who had paid their subscriptions for at least three months during the period of six months immediately preceding the reckoning.
- A union may claim to be recognized as a representative union for an industry in a local area if it has a membership of at least 25 per cent of the workers of that industry in that area.
- When a union has been recognized, there should be no change in its position for a period of two years.
- Where there are several unions in an industry or establishment, the one with the largest membership should be recognized.
- A representative union for an industry in an area should have the right to represent the workers in all the establishments in the industry. However, if a union of workers in a particular establishment has a membership of 50 per cent or more of the workers of that establishment it should have the right to deal with matters of purely local interest, such as, for instance, the handling of grievances pertaining to its own members. All other workers, who are not members of that union, might either operate through the representative union for the industry or seek redress directly.
- In the case of trade union, federations, which are not affiliated to any of the four central organizations of labour, the question of recognition would have to be dealt with separately.

Only the union which observes the Code of Discipline would be entitled to recognition. The Code of Discipline is explained later in the chapter.

### ABSENTEEISM

Absenteeism is the total man-shifts lost due to the absence of the total number of man-shifts scheduled to work. It, therefore, signifies unauthorized, unexplained,

avoidable and wilful absence from work. Normal absence is excluded from this category as an employee usually takes leave of absence with prior permission of the authority to meet his own personal exigencies. Such exigencies may be on the ground of sickness, certain domestic eventualities, accidents, etc. In all the cases, an employee may not take prior permission from his employer but may regularize his absence giving intimation within a scheduled period of absence. In most of the cases, if an employee remains absent from work for more than three consecutive days without any intimation, it is considered as wilful or unauthorized absence. This, therefore, makes an employee liable to give intimation within three days from the date of his absence to regularize his leave. Absenteeism is, therefore, a wilful or habitual absence from work and not any other types of absence.

Willful or habitual absence contributes to the production loss and, therefore, it is a major problem for the management. The problem of absenteeism at macro level in India varies from industry to industry. Such rate normally varies from 7 per cent to 30 per cent in Mining, Textile, Jute, Plantation and Engineering industries.

Although there are a number of studies on the problems of absenteeism at unit level, the macro-level data on absenteeism in India is yet to be available to study the phenomenon both behaviourally and economically.

National Productivity Council carried out a survey to understand the magnitude of absenteeism and could find that personal sickness, family sickness, domestic and social exigencies are the most important factors for absenteeism in Indian industries. Other factors of absenteeism like drunkenness, poor interpersonal relationships, genuine transportation problems, need for leisure, etc., are responsible for relatively less percentage of absenteeism. No matter what may be the factors of absenteeism, any organization needs to ensure better working environment, good inter-personal relationships, less industrial fatigue, adequate welfare facilities, motivation, quick redress of the grievances for reducing the rate of absenteeism. If all the above measures do not succeed, organizations need to educate workers and give counselling to make them aware of the effect of absenteeism, duly mentioning the financial loss sustained by them (in terms of wage loss) and problems, which the organization suffers.

### LABOUR TURNOVER

Labour turnover is the rate of change in the working hands of a particular organization during a given period. It, therefore, signifies the shifting of workforce from one organization to another and also the loss of manpower due to discharge, retirement, death, etc.

The rate of labour turnover is expressed in terms of accession and separation rate. *Accession* is addition to the workforce while *separation* is deletion from the workforce, for any of the reasons mentioned above. Labour turnover is a serious problem for the industry because of the following reasons:

- (a) High cost of recruitment to effect replacement
- (b) High training cost
- (c) Loss of supervisory and managerial time
- (d) Slow rate of output of the new incumbents
- (e) Damage to the plant and machinery
- (f) High rate of scrap and waste, etc.

In India, due to less scope for job mobility, labour turnover and job change or job switch is not a serious problem, except in some particular occupations where knowledge and skill of workers are relatively more. In high profile jobs, turnover is more due to the increase of scope of job switch.

To encounter the problem of labour turnover, it is necessary for the organization to initiate same action as pointed out in the case of managing the problem of absenteeism earlier. However, a little more attention is required to sustain employee motivation by fulfilling both their intrinsic and extrinsic needs.

### SCHEME FOR PARTICIPATION OF WORKERS' IN MANAGEMENT

In December 1983, following a review of the progress of participative schemes in industry, a new scheme was prepared and notified. This scheme is applicable to all central public sector enterprises, except those specifically exempted. It envisaged constitution of bipartite forums at shop and plant levels. *In enterprises considered suitable, it was also to be implemented at the board level.* The mode or representation of workers' representatives was to be determined by consultation with the concerned unions—any parity in representation between the management and unions can continue to be the norm.

The scheme has brought a wider spread of work-related issues within the ambit of the councils. At the plant level, the council could discuss issues relating to personnel, welfare, environment and community development, plant operations and functioning, and also take up financial matters relating to profit and loss statements, balance sheets, operating costs, plant financial performance, labour and managerial costs, etc.

### GENERAL POLICY ON INDUSTRIAL RELATIONS

General policy on industrial relations covers following areas:

- Monitoring of industrial relations (man-days lost in strikes and lockouts/workers affected by closure/retraining, reasons for labour unrest and industrial sickness, etc.)
- Convening of meetings of Industrial Tripartite Committees and Special Tripartite Committee.
- Decisions on closure, retraining and lay-off applications submitted by Central Public Sector Undertakings (CPSUs)
- Policy matters relating to employees in CPSUs on the payment of statutory dues of workers, impact of disinvestments and restructuring of PSUs on employees, improvements in Voluntary Retirement Scheme/Separation Scheme, etc.)

### Special Tripartite Committees/Industrial Tripartite Committees

Seven industrial tripartite committees have been constituted with the view to promote the spirit of tripartism. These tripartite bodies aim at solving the industry specific problems related to workers in the Sugar industry, Cotton Textile industry, Electricity Generation and Distribution, Jute industry, Road transport, Engineering industry and Chemical industry. In addition, a Special Tripartite Committee has

been constituted to discuss general matters pertaining to Government's reforms policies and their impact on workers.

### CODE OF DISCIPLINE IN INDUSTRY

Maintaining discipline in industry is an important part of industrial relations and labour welfare issues. To maintain discipline in industry both in public and private sector, the Code of Discipline was formed in 1958. While for public sector enterprises, it was made mandatory to follow the norms; however, for private sector enterprises, it provides more of suggestive guidelines to ensure smoothening of industrial relations. According to the code, there has to be—

- (a) A just recognition by employers and workers of the rights and responsibilities of either party, as defined by the laws and agreements (including bipartite and tripartite agreements arrived at all levels from time to time).
- (b) A proper and willing discharge by either party of its obligations consequent on such recognition

Both, the Central Government and the state governments, on their part, are required to examine and set right any shortcomings in the machinery they constitute for the administration of labour laws.

To ensure better discipline in industry, both the management and union(s) should agree on the following aspects:

- (a) No unilateral action should be taken in connection with any industrial matter, and that should be settled at the appropriate level
- (b) The existing machinery for settlement of disputes should be utilized with the utmost expedition
- (c) There should be no strike or lockout without notice
- (d) Both the management and union(s), affirming their faith in democratic principles, bind themselves to settle all future differences, disputes and grievances by mutual negotiation, conciliation and voluntary arbitration
- (e) Neither party will have recourse to (i) coercion, (ii) intimidation, (iii) victimization or (e) go-slow
- (g) They will avoid, (i) litigation, (ii) sit-down and stay-in strikes and (c) lockouts
- (h) They will promote constructive cooperation between their representatives at all levels and also between the workers themselves and they will abide by the spirit of agreements mutually entered into
- (i) They will establish upon a mutually agreed basis, a grievance procedure, which will ensure a speedy and full investigation leading to settlement
- (j) They will abide by various stages in the grievance procedure and take no arbitrary action which would bypass this procedure
- (k) They will educate the management personnel and workers regarding their obligations to each other

Management should agree on following points:

- (a) Not to increase workload unless agreed upon or settled otherwise

- (b) Not to support or encourage any unfair labour practice such as (i) interference with the right of employees to enroll or continue as union members, (ii) discrimination, restraint or coercion against any employee because of the recognized activity of trade unions (iii) victimization of any employee and abuse of authority in any form
- (c) To take prompt action for (i) settlement of grievances (ii) implementation of settlements, awards, decision and orders
- (d) To display the provisions of this code in the local language(s) in conspicuous places in the undertaking
- (e) To distinguish between actions justifying immediate discharge and those where discharge must be preceded by warning, reprimand, suspension or some other form of disciplinary action and to arrange that all such disciplinary action should be subject to an appeal through normal grievance procedure
- (f) To take appropriate disciplinary action against its officers and members in cases where enquiries reveal that they were responsible for precipitate action by workers leading to indiscipline
- (g) To recognize the union in accordance with the criteria evolved at the 16th session of the Indian Labour Conference held in May 1958

Trade Union(s) should agree on following points:

- (a) Not to engage in any form of physical duress
- (b) Not to permit demonstrations which are not peaceful and not to permit rowdyism in demonstration
- (c) Their members will not engage or cause other employees to engage in any union activity during working hours, unless as provided for by law, agreement of practice
- (d) To discourage unfair labour practices such as (a) negligence of duty, (b) careless operation, (c) damage to property, (d) interference with or disturbance to normal work (e) insubordination
- (e) To take prompt action to implement awards, agreements, settlements and decisions
- (f) To display in conspicuous places in the union offices, the provisions of this code in the local language(s)
- (g) To express disapproval and to take appropriate action against office-bearers and members for indulging in action against the spirit of this code

### COLLECTIVE BARGAINING

Collective bargaining is a method to determine working conditions and terms of employment through negotiations. Negotiations take place between 'employers' organizations and one or more workers' organizations. Negotiations process helps to reach an agreement. Collective bargaining is considered as an economic institution and trade unionism by forming a labour cartel restricts the entry of business into the trade. This theory of Industrial Democracy was advocated by Webbs or Sidney and Beatrice Webb in 1987. Alan Flanders (1975) discarding this concept advocated that collective bargaining is basically political as it aims to

protect dignity rather than economic interest. Marxist school considers collective bargaining as a means of social control. The marketing concept considers collective bargaining process as a constitutional system to determine relations between management and trade unions. Finally, the concept of industrial relations views collective bargaining as a system of 'industrial governance'. In practice, however, we do not consider any theoretical distinction. All these theories converge on three basic issues, which define collective bargaining. It is (i) a means of contract for the sale of labour, (ii) a form of industrial government and finally (iii) a system of industrial relations.

International Labour Organization (ILO) defines the term 'collective bargaining' as 'negotiations about working conditions and terms of employment between an employer, a group of employers or one or more employers' organizations, on the one hand and/or more representatives of workers organization, on the other hand, with a view to reach an agreement.

In collective bargaining, the object is to arrive at an agreement on wages and other conditions of employment about which the parties start with divergent view points, but ultimately attempt to make a compromise. As soon as the bargain is made, the terms of agreement are put into operation. On the other hand, the major task of the latter relates to the sharing the information and suggestions with regard to issues of common interests including health, safety, welfare and productive efficiency.

Mary Sur observes that collective bargaining starts with claims advanced by both sides—demands from the union and statements by the management on how far they can concede these demands and what they want in return. It is just the way the bazaar vendor and buyer start by quoting prices which are at variance, each knowing that he will have to make some accommodation in the end in order to reach a final agreed price. According to *Encyclopedia of Social Sciences*, 'Collective bargaining is a process of discussion and negotiation between two parties, one or both of whom is a group of persons acting in concert. The resulting bargain in an understanding as to the terms and conditions under which a continuing service is to be performed ... More specifically, collective bargaining is a procedure by which employers and a group of employees agree upon the conditions of works'.

The most comprehensive definition of collective bargaining has been provided by Trade Unions and Labour Relations (Consolidation) Act 1992 (TULRCA 1992), Section 178 (1) and (2) of U.K. Employment Law Programme. It is a negotiation connected with one or more of the following:

- (a) Terms and conditions of employment or the physical conditions in which any workers are required to work
- (b) Engagement or non-engagement, or termination or suspension of employment or the duties of employment of one or more workers
- (c) Allocation of work or the duties of employment between workers or groups of workers
- (d) Matters of discipline
- (e) A worker's membership or non-membership of a trade union
- (f) Facilities for officials of trade unions,
- (g) Machinery for negotiation or consultation and other procedures, relating to any of the above matters, including the recognition by employers

or employers' associations of the right of a trade union to represent workers in such negotiation or consultation or in the carrying out of such procedures

*Important assumptions to achieve a stable collective bargaining:*

- (a) Though employers and employees have different interests, these differences are not irreconcilable. Instead, they are somewhat the same as the difference between buyers and sellers in general. Therefore, through bargaining, a deal can be cut, which sets the price and regulates the conditions under which employees sell their labour
- (b) Each side accepts the legitimacy of the other and its right to survive
- (c) The sides are roughly equal in strength; otherwise, one side will dominate rather than bargain with other
- (d) The union legitimately represents the interests of all of those it claims to represent (a claim sometimes questioned by women and members of minority groups).
- (e) Both parties are willing to negotiate seriously with the aim of reaching agreement
- (f) If agreement cannot be reached, it is legitimate for either side to exert economic pressures (even as strike or lockouts) in order to induce the matter to make concessions. This type of pressure, which is usually regulated by law or the accepted rules of fair play differs among countries
- (g) The government plays only a limited direct role in bargaining

### Role of Government in Collective Bargaining

The government may influence collective bargaining and employment conditions in ways which differ greatly among countries. Some of the roles can be listed as under:

1. It may determine employment conditions by law, for example, through setting the minimum wages, legislating the length of holiday or preventing ethnic discrimination.
2. It may provide some benefits directly, for example, pensions.
3. It may set the ground rules which govern the parties; conduct to take an example, through giving unions the right to bargain, restricting the conditions under which strikes may occur or determining the scope of bargaining.
4. It may settle disputes which the parties are unable to settle themselves often through mediation or arbitration. In Australia, conciliation and arbitration play major roles in determining the conditions of employment.
5. Through its macro-economic and social policies, it affects the terms of bargaining agreements.
6. The government is a major employer itself and often bargains with unions representing its employees, frequently setting a pattern for the entire economy. In fact, union density is higher in the public sector, rather than in the private sector in most countries today.

Further more, as the presumed representative of the public interest, the government is interested in industrial peace, price stability, increased productivity

and non-discriminatory employment patterns. To achieve these objectives, it can pressure the parties (often through legislation). One the other hand, the parties too can pressurize the government (often through political action). Thus, the government is a third party in collective bargaining combining the often conflicting roles of neutral and bargainer.

Three examples illustrate the range of governmental roles:

- The USA Government is primarily (and perhaps ineffectively) a referee in collective bargaining
- In Latin American countries, where collective bargaining is poorly developed, the parties pressure the state to obtain conditions which in if government participation is more, collective bargaining process would not be voluntary

### Characteristics of Collective Bargaining

From the foregoing definitions of collective bargaining, some essential characteristics may be enumerated as follows:

- (a) It is a group action as opposed to the individual action and is initiated through the representatives of workers and delegates of the management at the bargaining table.
- (b) It is flexible and mobile and not fixed or static. It has flexibility and ample scope for compromise for a mutual give-and-take, before the final agreement.
- (c) It is a two-party process. It can succeed only when labour and management want to succeed. There must be a mutual eagerness to develop the collective bargaining procedure. It can flourish only in an atmosphere which is free from animosity and reprisal.
- (d) It is a continuous process, which provides a mechanism for a continuing and organized relationship between management and trade unions. The heart of collective bargaining is the process for continuing joint consideration and adjustment of plant and problems.
- (e) The term is dynamic itself because the concept is growing, expanding and changing.
- (f) It is industrial democracy at work.
- (g) It is not a competitive process but a complementary process, i.e., each party needs something that the other party has, viz, labour can make a greater productive effort and management has the capacity to pay.
- (h) It is an art, an advanced form of human relations. One can witness the oratory skills, dramatics, coyness and the bluffing, mixed in an inexplicable fashion which may characterize a bargaining session.

### Importance and Need for Collective Bargaining

It is evident from the foregoing discussion that to settle differences on the work-related issues, collective bargaining as a process is perceived both by employers and employees and important machinery. We have adequately covered the general issues, which are usually settled through collective bargaining.

The need for collective bargaining in India arose due to some controversial problems, which the Indian industry had to face post-World War II. One of the most important among these is that of modernization. The problems of modernization and productivity are to be viewed in a proper light in the context of industrial development on planned lines. Indian industry cannot compete in foreign markets if it does not follow modern methods of production. Since modernization causes displacement of workers, it naturally invites hostility and the workers and the management must, therefore, come together in their viewpoint through collective bargaining. The solution of common problems can come from legislative measures. Collective agreements provide the climate for smooth progress as there is ample scope for a synthesis between demands from one side and concessions from the other.

- (a) In individual bargaining, the workers may be tempted to accept undesirable conditions and may thus bring down the general level of remuneration. Due to immobility of labour, all workers are not in a position to desert a wage-cutting employer. This immobility may be due to the ignorance and illiteracy and industry-specific skill factors.
- (b) The speedy workers may accept a lower rate of payment, which may yield them a reasonable amount of wages, but such a low rate of wages would yield insufficient earnings to a great majority of workers.
- (c) Sometimes employers are in a position to control the bulk demands for the labourers, and they may through combined action, force the workers to accept low wages. Collective bargaining is the only device, which can avert such combined action and prevent the creation of such monopolistic tendencies.
- (d) The market apparatus consisting of the two forces of demand and supply can settle only the problem of determination of wages, some of the non-wage issues like the length of working day, health and safety of workers, speed operations, introduction of rationalization measures of security of job have to be settled by personal decisions and not by the forces of demand and supply.
- (e) Collective bargaining also provides some voice to the conduct and management of the industry. Workers have now a definite place in the exercise of a real influence in the determination of labour matters affecting them every now and then.
- (f) To ensure continuity of production, workers and employers must shake hands, and this makes it inevitable to make collective bargaining a regular feature of industrial life.
- (g) The problem of good human relations can be tackled successfully by collective bargaining process.

### Prerequisites for Collective Bargaining

The success of collective bargaining machinery largely depends on the respective attitudes of workers, in general, and the union, in particular on one hand and the attitude of management of employer on the other. However, if collective bargaining is to exist in a country successfully the following factors are essential:

1. It is necessary for the management to recognize the union and to bargain in more good faith. This also puts pressure on the union to formulate plans and demands in a systematic manner.
2. There should be a change in the attitude of employers and employees. They must realize that collective bargaining approach does not imply litigation as it does under adjudication. Both the parties should keep this in mind that they have to resolve their differences on their respective claims quietly and calmly, with their own resources, reducing their dependence on the third-party intervention.
3. For the purpose of collective bargaining, employers should be represented by the management and workers by their union representatives. Careful thought and selection of the negotiating team is very much essential. For management team, it is better to have a mixed composition, such as production, finance, industrial relation experts and headed by a personnel expert.
4. It is also appreciable to have open minds; each party should listen to others' concern and point of views and should have some flexibility in making adjustments to the demands.
5. To ensure collective bargaining, unfair labour practices should be avoided and abandoned by both; otherwise, atmosphere and confidence will be vitiated by malpractice if either side takes advantage of the other by resorting to unfair practices.
6. Either side should avoid putting any irrational or unreasonable demand.
7. Negotiations can be successful only when the parties rely on facts and figures to support their points of view. That is why trade union should be assisted by specialists, viz., economists, productivity experts, etc.
8. Trade union should encourage the internal union democracy and periodic consultation with the general rank and file of the union members.
9. The terms of contract and the results of the negotiation should be in writing and should be embodied in a document. If no agreement is reached the parties should proceed to conciliation, mediation or arbitration. If no settlement is arrived, then the workers should be free to go in for strike and the employers for lockout. However, utmost care should be taken to resolve difference mutually.
10. Strikes and lockouts should be the last resort. Periodic discussions may be necessary between management and unions to interpret the provisions of the contract and clarify doubts.
11. Trade unions should be equally concerned with quality of work that leads up to a consistent concern for the viability of the firm and its products and services.
12. Once the agreement is reached, it must be honoured and fairly implemented.

### SUMMARY

Industrial relations and labour welfare are two important areas governing employer-employee relations and benefits. For efficient management of

an organization, it is essential to nurture healthy industrial relations and provide benefits to workers, both statutory and non-statutory. In India, we have several acts and legislations concerning these two areas. We have briefly introduced these here. Many organizations, to derive motivational benefits provide welfare benefits beyond what are statutorily required. For example, TISCO much before formal enactment of various rules and regulations provide welfare benefits to workers. They even provide some benefits and services to employees beyond statutory requirements. These are healthy practices. Trade unions are voluntary organizations of workers. Through joint action, they protect and promote the interest of workers. With the setting up of large-scale industrial units, a new class of workers, dependent solely on wages for their livelihood, has emerged in India. The other important area of industrial relations and labour welfare is collective bargaining. Collective bargaining is a voluntary process of negotiation between employers and employees to determine various terms of employment. The process ensures organizational democracy. However, it often transpires as ineffective process of reaching to an agreement. Over the years, importance of collective bargaining is receding globally. Most of the organizations prefer to have enterprise-wide bargaining rather than industry-wide bargaining. Even industry-wide bargaining agreements are not implemented by many organizations within the same industry group.

### Key Words

**Political Theories:** These theories focus on macro level issues concerning political-economic purpose of society, like, class characteristics of the state, conflict between the classes, the exploitative element of economic and industrial structures and systems, issues concerning ownership, role of working class, political power, etc.

**Apolitical Theories:** These theories are concerned with micro organizational questions at the strategic, functional and operational levels of the firm or the industry.

**Industrial Relations (policy general):** This pertains to monitoring of industrial relations (man-days lost in strikes and lockouts/workers affected by closure/restructuring, reasons for labour unrest and industrial sickness, etc.).

**Group Insurance:** According to this, public liability insurance for installations that handle hazardous substances is mandatory to ensure that minimum relief may be given to victims. This is based on the principle of strict liability.

### REVIEW QUESTIONS

1. Define industrial relations and labour welfare.
2. Briefly discuss various labour welfare measures that are statutorily required to be complied with by an organization.
3. What are the recent amendments to the Trade Unions Act? How do these amendments help in better industrial relations?
4. Discuss the code of discipline and its significance to industrial relations.
5. Briefly point out the process of workers' participation to management.

6. Briefly point out the history of Trade Union Movement in India.
7. Do you think trade unions in India are becoming defunct institutions? Give adequate justification for your answer.
8. Define collective bargaining. What are its important characteristics. What are the important prerequisites of its success?

### Short Notes:

- (a) Code of Discipline
- (b) The Shops & Establishment Act
- (c) The Employment (Standing Orders) Act
- (d) Industrial Tripartite Committees
- (e) Labour Turnover

### REFERENCES

1. Bhattacharyya, Dipak Kumar. 2006. *Human Resource Management*, 2nd edition. New Delhi: Excel Books.
2. Bhattacharyya, Dipak Kumar. 1999. *Managing People*. New Delhi: Excel Books.
3. Davis, K. 1957. *Human Relations in Business*. New York: McGraw-Hill Book Company, Inc.
4. Flanders, Alan. 1975. *Management and Unions: The Theory and Reform of Industrial Relations*. London: Faber.
5. Gary, Dessler. 1998. *Human Resource Management*, 7th edition. New Delhi: PHI.
6. Webb, Sidney, and Beatrice Webb. 1987. *Industrial Democracy*. London: Longmans, Green and Co.
7. Yoder, D., Henceman, H.C., Turnbull, J., and C.H. Store. 1958. *Handbook of Personnel Management and Labour Relations*. New Delhi: McGraw-Hill Book Company.

# Introduction to Production and Operations Management

## LEARNING OBJECTIVES

By the end of this chapter, a student would be able to:

- comprehend the definition and concept of production and operations management
- know the production characteristics
- understand the production system
- be familiar with the functions of production and operations manager

## INTRODUCTION

Production management has now become an independent branch for study and specialization with interdisciplinary approach. Although, the tasks of production in organizations are assigned to those who have exposure to technical and engineering disciplines, with management inputs or knowledge they can function better, as timely delivery, productivity, cost effectiveness and quality are now considered crucial for sustaining the competitive pressure. In manufacturing set-up, the term *production management* is used, whereas, *operations management* is a wider concept, which not only includes traditional manufacturing but also broadly encompasses process, programmes, plants and people.

Traditionally, production function is considered as the manufacturing function and so also the process, limiting its focus only to engineering aspects. However, production now encompasses services also and in that way it is now like any value-added activity. Thus, production is not only the traditional manufacturing process of converting inputs to outputs, it encompasses all operational activities of any organization that broadly assist in manufacturing and so also rendering of services. For the purpose of this book, we have used the term production and operations interchangeably.

Production management is concerned with the decision making related to production processes, so as to ensure that output is

cost effective, meeting the delivery schedules, conforming to quality and achieving customer satisfaction.

A general descriptive model of production has following characteristics:

### Inputs

Inputs are those things which are used in the production. Inputs may include raw materials, spare parts, any other consumable items, energy, know-how (knowledge, technical details, etc.), plans, programmes or schedules. Inputs, therefore, may be both physical or abstract.

### Process

After all the inputs are made available, the next stage of production starts with processing of inputs through a number of operations. Number of operations varies with the nature of output. For achieving efficiency, production processes are conveniently divided into number of operations, entrusting each operation to a separate group with the specialized knowledge in doing the same job. Processing is done using labour services with plants, equipment and machineries.

### Outputs

After processing of inputs, outputs are received both in the physical or abstract form. At the processing stage, functions are monitored to conform the output to customers' requirements by achieving quality and cost effectiveness and by meeting the delivery schedules.

In addition to the above three important characteristics of a production system, storage, transportation and management information systems are also considered important, as total production system cannot be effective without these three supporting stages.

1. *Storage* is important both for storing of received input materials, semi-processed materials (work-in-progress, where production process is divided into number of stages) and finished goods or output.
2. *Transportation* within the factory or organization is also necessary for carrying semi-processed goods from one shop to another for different stages of operation. This type of transportation is done using battery-operated slow-moving small truck, fork lift, etc.
3. *Management information system (MIS)* links all physical activities through an efficient feedback mechanism and thus helps in enforcing control and/or correcting deviation from the plan. It also provides the basis of managerial decisions.

Even though the terms 'production' and 'operations management' have been used interchangeably for the purpose of the present book, we find many authors have delineated the concepts first and then used it integrating the approach, keeping pace with modern corporate practices. Without stretching the debate, we can say that operations management is the management of the conversion of inputs into intended outputs, which may be either tangible (goods) or intangible (services).

Therefore, operations functions have some basic elements, as we could list from the above definition. It has (a) conversion process, which utilizes (b) some inputs to produce some (c) intended outputs. However, this is a more classical way of defining the concepts. Due to its strategic focus and integration with enterprise-wide decision support systems (DSS), the modern approach also integrates information feedback in the model of operations functions.

Adam and Ebert (1995) while explaining the model have pointed out that in a production/operations function, while in the process of conversion, some unplanned or uncontrollable influences may cause deviation in actual output than what has been envisaged. They have categorized such influences as random fluctuations, examples of which are strikes, floods, fire, lightning, etc. Even though by and large such influences are for exogenous factors, some may also occur due to endogenous or internal factors. In such cases, random fluctuations are uncontrollable. Feedback loop in the model is intended to provide key information, so as to ensure control over operations by suitable intervention.

While explaining the basic framework of production and operations management, Muhlemann, A., J. Oakland and K. Lockyer, (1993) warned that functions of production and operations management are interdependent; hence, dividing the two may destroy the conceptual clarity. Even though distinction between the manufacturing and service operations is difficult, in line with Adam and Ebert, we can differentiate between the two on following counts:

- Nature of outputs, which may be either tangible or intangible. Manufacturing operations are identified by tangible outputs, whereas, service operations are identifiable by intangible outputs.
- In case of manufacturing or tangible outputs, consumption pattern, continue over a time period, but for service operations or when output is intangible, we find that customers consume the same immediately.
- Nature of jobs for manufacturing is more technology intensive. In this case, the usage of labour as an input is relatively less. However, for service operations, we find usage of labour more than any equipment.
- Degree of customer contact in manufacturing is relatively less than in service operations. This is because even though conversion in manufacturing is essentially done for customers, their physical presence in conversion site is not tenable. However, since services are rendered direct to customers, in service operations, we find a higher degree of customer contact.
- Customers' participation in manufacturing operations is, therefore, relatively low, whereas, it is high in service operations.
- Performance measurement for manufacturing is quantitative, whereas, for service operations it is qualitative.

However, distinctions between manufacturing and services on the above counts may not be always feasible with the changing technology and management styles and philosophy. To take an example, in the process of making organizations increasingly customer focused for sustaining the competitive edge, we find an increasing trend to customize output using a flexible or job-shop type of manufacturing facilities. In management strategy also, we find that overriding priority is given to customers, whose feedback are used for effecting change.

Six-sigma approach lends to customer-centric recreating process in organizations both for improving the bottom line and enhancing customer satisfaction (by giving them increased value for money). Customer Operations Performance Centre (COPC) approach, primarily for IT-enabled service (ITES) operations, a joint product of Dell, Microsoft and American Express, also emphasizes customer/client satisfaction.

The introductory discussion, therefore, suggests actual differences between manufacturing and services getting narrowed; hence, attributing production to manufacturing and operations to services would be a historic approach. Using the term 'operations' more holistically encompassing manufacturing and services is, in fact, the right approach. However, for the obvious problem of division as explained earlier, using the term 'production and operations management' (POM) would be a better choice.

A better definition of POM would, therefore, be a value-added transformation process and not just a conversion of inputs into goods and services of the desired quality by optimum utilization of resources at minimum cost. The elements of definition, therefore, would be:

- Optimum utilization of resources
- Achieving desired quality in goods and services
- Achieving cost efficiency in transformation process
- Value-added activity

Value addition is ensured by alteration, transportation, storage and inspection. Alteration is a process of change effected in the state of inputs, which is physical in nature, for manufacturing and for rendering services. Transportation is the movement of goods and services from one place to another. Like alteration, transportation also adds value from the customer's point of view, when outputs are made available at different locations with better logistic support. ATM is a very good example of value-added banking services for customers. Similarly, supply or distribution chains make the outputs of a manufacturing process available in different locations. This also adds value from the customers' point of view. Storage also adds value to the customers, when organizations by ensuring the storage of outputs in a protected environment to make the same available to the customers over a period of time.

We know that physical output, with a long shelf life, is stored by organizations to make the same available to customers when they require. Similarly, service outputs in the form of data and information may be made available by a service provider through their data warehouse, which a customer can utilize over a period of time. Inspection process adds value to outputs when through this process organizations ensure that the outputs conform to quality standards.

Apart from these, recent developments in POM (like making POM systems compatible with environment yet efficient), are also offering new opportunities to organizations. Effluent Treatment Plants (ETP) not only reduce the harmful by-products but also provide opportunities to organizations to maximize their gain by waste recycling, generating energy (sintering plant for steel manufacturing unit) or by using recycled water for cooling towers, etc.

Achieving zero defects through six-sigma approach to sustain a competitive advantage is yet another new development in POM. Six-sigma suggests recreating an error-free measurable process through innovation.

## MODELS FOR PRODUCTION AND OPERATIONS SYSTEMS

The objective of any production/operations system is to add value to outputs (goods or services) following a framework of activities. A sample of production/operations system can be expressed mathematically as under:

$$Y = f(c_1, c_2, c_3, \dots, c_n)$$

where 'Y' is the output and  $c_1, c_2, c_3, \dots, c_n$  are the inputs.

What should be the type of production/operations systems would again depend on number of factors. Broadly, however, it depends on nature of products/services and type of production. While nature of products/services may be any thing like, chemical, pharmaceutical, textile, electronic, banking, telecommunication, BPO/HRO, etc., the type of production/operations may be engineering, process, extraction, cognitive, etc.

To determine the outcomes of proposed courses of action in POM, we use different models. A model is defined as a replica or abstraction of important characteristics of a process. It explains the interrelationships between various factors of a POM process. By simulating models, we can understand the problems, if any, in a given POM system. In POM, we generally use the following type of models—

**Verbal/Written/Descriptive/Physical Models:** All these models are categorized under one group because of their commonality to explain the situation by scaling down to a manageable limit. Verbal/written/descriptive models explain a situation in words, while physical models explain a situation by a physical replica duly scaling down a machine or a structure. Physical models are also known as *iconic models*.

**Schematic Models:** These are shown by charts, graphics, maps of routings, network diagrams, etc.

**Mathematical Models:** These show functional relationships among different variables using mathematical symbols and equations. In POM, we use two types of mathematical models:

- Optimization models, which help to analyse problems and suggest solution
- Heuristics models, which are some established decision-making procedures to solve a problem

In linear programming, we try to achieve best feasible solution within some given constraints. This is one example of optimization model, which we use in POM. Another example of optimization model can be a simple equation as under:

$$TC = F + vN$$

Here, we assume total cost (TC) is the function of fixed (F) and variable unit cost (vN).

Heuristic model is a rule of thumb (e.g., set of steps) that we use in POM for a solution to a problem, which may not, however, be optimal. For line balancing, i.e., the assessment of total work to be done or performed on a line, duly breaking the tasks and assigning the tasks to work stations, we use heuristic models. Here, we apply a set of rules systematically as an algorithm.

Using various models, we can control the variables in production/operations systems, understand the cost implications and make best trade-offs among costs. Throughout the book, we have used various models for explaining the POM systems.

## INTERRELATIONSHIP OF POM WITH OTHER MANAGEMENT FUNCTIONS

POM is not an isolated function in an organization. To achieve its full potential, it has to relate to other support functions of the organization. Even though marketing, finance and production/operations are construed as three primary functions within an organization, functions like, R&D and engineering, human resources and information systems also receive varying emphasis.

However, we are not quite sure about the degree of interdependence. In fact, this varies depending on the nature of the organization. Using a pie chart, we can illustrate the degree of interdependence of POM with other management functions.

It is important to mention that with enterprise-wide decision support systems (DSS) many other management functions also contribute to POM by making available vital inputs for decision making. One such example is benchmarking the competitors. Although collecting benchmarked data about competitors is not so easy, organizations with their network still endeavour to collect such data to understand how they are placed in cost and quality terms in comparison with their competitors. Using BPO-HRO, many organizations gain cost efficiency by outsourcing their non-core activities. An integrated *supply chain management* (SCM) can help them to achieve this.

Similarly, *human resource information systems* (HRS) also make available data on HR costs, which are important cost inputs for POM.

## PRODUCTION SYSTEM

In organizations, production system widely varies either because of the product nature or because of the existing production facilities. Broadly, it can be categorized either as continuous or intermittent. *Continuous flow of production* is possible where facilities are standardized. Assembly lines and the continuous flow of chemical operations are examples of this type of production system. *Intermittent type*, on the other hand, follows a flexible system to accommodate a wide variety of products of different sizes, i.e., a job-shop type machine shops, fabrication shops or batch-type chemical operations. This type of production system is also known as *customized production system*. Both the systems have their advantages and disadvantages.

## MANUFACTURING PLANT

Before going into the details of production planning and control, it is also important to introduce in brief the technical details of manufacturing plant, its location, factory buildings, service facilities, plant layout, materials handling, manufacturing processes and machining processes. Even though technical details widely vary, they have certain commonalities and standard norms. Without going into their

elaborate technical details, brief discussions would be made here just to familiarize those who have not experienced the manufacturing environment.

Decision on location of plant depends on a number of factors, like, proximity to the source of raw materials, labour, transportation and communication facilities, availability of power and fuel, nearness to markets, etc. For rational decisions, it is the usual practice to assign weights to each such cost factor and then compute the relative merits or cost ratios of one location over the other and multiply these to arrive at the comprehensive figure of two alternative locations. This is known as *dimensional analysis*. Decision on plant location also involves decision on buying or renting, considering the opportunity cost.

Similarly, decision on factory buildings, i.e., single story or multi-story is also taken based on the floor load, building vibration, noise, natural light and ventilation, easy material handling, economic utilization of space, etc. In some cases, single-storied factory buildings may be desirable, whereas, in some other cases, multi-storied factory buildings may be more desirable.

Service facilities include plant utilities and employees services. Some of the plant utilities are safety, pollution/effluent treatment and control. The services or facilities of most of the employees' are statutorily required to be provided. However, for efficient management and to reap the advantage of increased employee motivation, many organizations even provide facilities in addition to statutory norms.

Proper layout of the factory also forms an important part of production management functions. Layout depends on types of production system like, in case of job shop or functional organization, the *process type of layout* is more appropriate, whereas, in case of assembly-line organization, the *product type of layout* is more suitable. In addition, *layout by fixed position* is followed when heavy or difficult-to-move items are processed, like, shipbuilding; *mixed layout* (i.e., combination of product and process layout), is followed when multi-products are processed following the batch type of production system.

Material handling is another important part of production management function. It indicates placing and positioning of materials to facilitate their movement or storage.

The most important function of production management is production planning and control, which involve a series of activities to ensure the achievement of the objectives of the production department.

## OPERATIONS MANAGEMENT

Like any other managerial functions, operations management is also an important business function, which focuses on the process of transformation to create goods and/or services, keeping in view the customers' requirements. Both the internal and external customers' needs drive the functions of operations management, as every organization needs to adopt a customer-centric approach to provide the goods and services. Conceptually, operations management is similar to other managerial functions. However, specific focus areas are indicated below:

- Recognition of customers' needs
- Designing the transformation process capable to deliver customers' requirements

- Managing the transformation process
- Evaluating how customers' needs are satisfied with the nature of products and the type of services rendered by the organization

Even though operations management is considered as the first-level function in organizations, it is the most crucial function, as organizational success depends largely on the efficiency of this function. This function needs to be aligned with the customers' needs; it needs to coordinate effectively with the marketing and HR departments; it needs to identify and develop vendors and ultimately it requires to take responsibility for the business results.

## Successful Operations Management Practices

We have already clarified that operations management is a process of transforming inputs (capital, materials, labour, knowledge and information) to goods and services (output). Obviously, operations management practices require understanding of the entire gamut of operations function, ranging from decisions on design, planning and controlling functions. Hence, managing operations is not so simple, and it requires the ability to understand what to produce, the type of manpower required to produce the desired goods and services, what methods and processes are important to increase the productivity and quality, flexibility of production systems and the process to adopt to the changes, etc. Successful operations management practices also require interdepartmental coordination, like coordination with HR, Finance, Marketing, R&D, etc.

Thus, we can sum up a few important areas for successful operations management practices as follows:

- Understanding the process of development of realistic and measurable goals and objectives
- Understanding the techniques of short-range, medium-range and long-range plans
- Understanding the importance of teamwork and the methods of promoting teamwork culture in organizations
- Understanding how the overall or corporate strategies align with the specific actions taken at the operations level
- Understanding the significance of ethical operations management practices
- Understanding the concept of value addition
- Understanding how technology influences people and performance
- Understanding the effect of national level and international competition
- Understanding the influence of culture in operations management practices
- Understanding the concept of product-mix and how the appropriate product-mix can be selected for better synergy in a product line. (A product-mix is a type of product under a product line. Product line represents a line which produces homogeneous nature of products, viz., detergent is a product line for Hindustan Unilever and Surf, Surf Excel, Rin, Rin Shakti, Rin Advanced, Wheel, Sunlight, etc., are product-mix, i.e., the types of detergent)

- Understanding the basics of labour relations and various acts and regulations pertaining to labour management
- Understanding the effect of short-term economic trends

### Operations Management for Small Entrepreneurs

XYZ is a leading company based in New Delhi. Being a large manufacturing company, XYZ is encircled by a number of small business entrepreneurs in the area. XYZ, as part of their social responsibility decided to train the small business entrepreneurs. Basic issues of training are to make the small entrepreneurs aware about the operations management practices, particularly at the stage of start-ups. Accordingly XYZ, first made it clear to all small entrepreneurs, in and around the company that operations management practices are essential for each and every business, irrespective of their size, and at every stage of their life cycle, i.e., start-up or introduction, growth, maturity and decline. Small entrepreneurs are required to be extra cautious about the cash flow management, which has direct linkage with the use of resources and inventories. They need to understand tools and techniques, which are important to develop customer-centric process, methods of tracking customers' needs, ways and means to achieve customers' satisfaction and achieve the desired level of quality standards. There are other areas of concern in operations management for small entrepreneurs. Those are not customer centric, but are very important areas nonetheless. These are vendor development, inventory management, production scheduling, maintenance management (to avoid production loss for machine down time), etc.

XYZ's such initiative, also benefitted the company, as these small entrepreneurs with the efficient operations management practices, have now become much more matured to supply XYZ cost-effective, quality materials on real-time requirement basis. In the process, XYZ's inventory holding costs reduced to just half, and company's financial strength reached to a new peak, giving them the opportunity to sustain and grow in a fiercely competitive market.

### OPERATIONS STRATEGY

Operations strategy is a functional strategy. Basically, operations strategies are related to the process of transformation of inputs to outputs. Hence, such strategies provide the basis for any decisions at the operations level. Some of the indicative areas of operations strategy are—design of products (tangible and intangible), vendor selection, selection of appropriate process for transformation of inputs to outputs, production scheduling, etc.

Although strategy, *per se*, is more for taking long-term decisions, operations strategy are by nature more tactical and are more relevant for short-term and even day-to-day decisions. Some of the long-term decisions which are based on

the operations strategy are—location and facility planning, selection of technology, decision making or decision buying, selection of type of products and services, that the company intends to manufacture or provide, decisions on information systems and even the use of software, management-related decisions, etc. Tactical and even short-term decisions that are taken based on operations strategy are—production forecasting and planning, capacity planning, inventory management, etc.

### Operation Strategy Factors

From operations manager's point of view, it is important to study the following factors while adopting operations strategy.

- The number, type, size and location of operations facilities
- Type of equipment that will be utilized (focused and specific or general-purpose and flexible, automated or principally manual)
- Decision buying or decision making
- Organizational structure (whether it is suitable to accomplish and coordinate all the necessary efforts)
- The workforce selection, employment security, compensation methods and management style.
- The information systems that will be used to collect, analyse and distribute information on production, purchasing, inventory, quality, personnel, etc.
- Production planning, scheduling and control, system and inventory policy
- The quality of control and improvement methods that will be used
- The productivity improvement methods for machine/manpower

From the point of view of operations manager, operations strategy, therefore, shows how an organization develops game plan to derive competitive advantage. Operations function help the organization achieve a competitive advantage in the marketplace.

### OPERATIONAL CONTROL SYSTEMS

Strategic controls are useful to the top management in monitoring and steering the basic strategic direction of the company. Operations managers also require the control methods, befitting to their levels of strategy. The primary concern at the operating level is the allocation and use of the company resources. Operations control systems guide, monitor and evaluate the progress in meeting the annual objectives of the organization. Usually, following steps are taken for operational control:

- Set performance standards
- Measure the performance
- Identify deviations from the standards
- Initiate corrective action to make good the deviations

There are three types of operational control systems. They are budgets, schedules and key success factors.

## ROLE OF OPERATIONS MANAGER

Depending on the nature of organization, operations managers need to perform various managerial functions like, planning, directing, coordinating operations, decision taking, policy framing, controlling inventory, supply chain management, job scheduling, job-wise manpower allocation, etc. However, this is only an indicative list. Some organizations even assign the duties of chief executive officer to operations managers. In many organizations, we find the position of Chief Operating Officer at the operations level.

The functions of a operations manager even though vary with the nature of the products or services, it can typically have following commonalities—

1. **Production Planning and Control:** This involves deciding the course of action for actual production after the receipt of orders. Usually, Sales or Marketing Department receives or books orders from the customers and send their requisitions for manufacturing to Production Planning and Control Department and progress the job to ensure the execution of orders of meeting the customers' satisfaction. Effective production planning and control, therefore, ensure meeting the prime objectives of production, i.e., to manufacture and to deliver, meeting customers' requirements.
2. **Production:** After production planning and control, the next important function of a production manager is to ensure manufacturing or the production of finished goods in conformity with the plans.
3. **Inspection:** After production process is over, inspection or quality checking is necessary. This type of inspection is known as final inspection. However, for the increased emphasis on quality control, many organizations now also carry out in-process inspection. This minimizes the problem of rejection. In addition, inward inspection is also carried out for controlling the quality of raw materials and components.
4. **Engineering:** Manufacturing or production activities are also needed to be supported by design and development, which not only include designing tools, jigs and fixtures (this is done by independent Tool Room Department in large organizations) but also involves R&D activities for innovative product design and changes.
5. **Industrial Engineering:** A production manager is also required to carry out periodic *work study*, following *method study* or *work measurement technique* for systematic investigation of activities in order to ensure effective use of human and material resources. (While method study helps in finding the best way of doing a work, work measurement helps in assessing the time required for doing a job).
6. **Maintenance:** Production manager is also responsible for time-to-time maintenance of plant and machineries to minimize machine downtime and consequent loss of production. While traditional concept is breakdown maintenance, i.e., to attend plant and machineries only, when they become dysfunctional, modern concept is Total Productive Maintenance, which also calls for preventive maintenance action to minimize machine downtime.

7. **Interdepartmental Coordination:** A production manager is also required to maintain contacts with other departments, like, Sales Department with regard to production plan, Personnel Department for manpower availability and training and Materials Department for procurement of raw materials and other components.

## SUMMARY

Production management is concerned with decision making related to production processes, so as to ensure that output is cost effective, meeting the delivery schedules, conforming to quality and achieving customer satisfaction. The term 'production and operations management' is used in more general sense, and in today's context, we can hardly make any distinction. We can only draw a finer distinction between production and operations in the context that production management is concerned with the decision making pertaining to production processes, while operations management manages the process of conversion of inputs to outputs. Since both are the processes of value addition and both encompass each other, we cannot make a distinction between the two. In this chapter, we have introduced the basics of production and operations management functions and roles. Even at this level, i.e., the first level of management, production and operations manager need to adopt a strategy. This chapter also highlights the nature and type of strategy, which production and operations manager need to adopt.

## Key Words

**Storage:** It is important both for storing of received input materials, semi-processed materials (work-in-progress, where production process is divided into number of stages) and finished goods or output.

**Man Management Information System (MIS):** It links all physical activities through an efficient feedback mechanism and thus helps in enforcing control and/or correcting deviation from the plan. It also provides the basis of managerial decisions.

**Value Addition:** It is ensured by alteration, transportation, storage and inspection.

**Heuristics Models:** These models are some established decision-making procedures to solve a problem. Heuristic model is a rule of thumb (e.g., a set of steps) that we use in POM for solving a problem, which may not, however, be optimal.

**Operational Control Systems:** It guides, monitors and evaluates the progress towards meeting annual objectives. Operational control is enforced through setting of standards of performance, measuring actual performance, identifying deviations from standards and by initiating corrective actions.

**Maintenance:** Maintenance of plant and machineries to minimize machine downtime and consequent loss of production.

## REVIEW QUESTIONS

1. Is production management different from operations management? Do you think the principles of production and operations management can also be made applicable for the service industry?
2. Develop a model to illustrate production function of any hypothetical FMCG (Fast-Moving Consumer Goods) Company.
3. Prepare a Job Description Sheet for an operation manager.

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books.
2. Cohen, M.A. 1997. *Manufacturing Automation*, Chicago: Irwin.
3. Konz, Stephen. 1983. *Work Design: Industrial Ergonomics*, 2nd edition. New York: John Wiley & Sons.
4. Chase, Richard B., Nicholas J. Aquilano, F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
5. Adam, E.E., and R.J. Ebert. 1995. *Production and Operations Management*, 6th edition. New Delhi: Prentice Hall of India.
6. Muhlemann A.J. Oakland, and K. Lockyer. 1993. *Production/Operations Management*, 6th edition. London: Pitman.

## APPENDIX 15.1

## Job Description of Manager - Operations

The company is a domain-focused IT services partner of India's famous technology company, specializing in financial services, insurance and health-care segments.

## Tentative Job Descriptions:

1. Data Center Management
2. Server Management—System Administration including Backup/Restore Management, Patch Management and Aantivirus Management
3. Network Management (LAN/WAN)
4. Database Management (Oracle/MS SQL)
5. Vendor Management
6. Validation Management as per the Client SOPs
7. Change Management and Incident Management as per the Client SOPs
8. First-Level Scientific Applications Call Support

## Desired Profile

1. The candidate should have *eight to ten* years of IT experience with *three to five* years as a Team Lead/Operations Manager.
2. The candidate should have experience in team management with the team size of more than ten members.

3. The candidate should be handling all the technical call escalated.
4. The candidate should be willing to work as a team player in resolving the technical issues and drive the team for routine activities.
5. Coordination with other teams of IT across the organization.
6. Good communication skills written & verbal.

## Experience

10-12 years

## Industry Type

IT-Software/Software Services

## Education

UG—Any Graduate—Any Specialization, B.Pharm—Pharmacy, B.Sc—Any Specialization  
PG—Any PG Course—Any Specialization

# Production Planning and Control

## LEARNING OBJECTIVES

After reading this chapter, a student would be able to:

- comprehend production planning and control, i.e., the concepts and differences
- know the production planning functions
- be familiar with the steps involved in the product planning process
- appreciate the objectives of production planning
- understand aggregate planning
- know the Master Production Schedule
- be familiar with the Capacity Requirements Planning

## INTRODUCTION

Production managers are required to forecast future events, which have potential effects on their activities. Such forecasting may either be a long-run estimates or short-run estimates of demand. While discussing the planning functions in Chapter 2, we have already detailed about the forecasting function. All the forecasting tools mentioned in Chapter 2, also hold good for production forecasting. Hence, in this chapter, we would not discuss the forecasting details here. From production managers' point of view, forecasting is important for planning, scheduling and controlling the system to achieve efficient output of goods and services.

Planning of the system is done by the production managers by forecasting aggregate demand, and it helps to design or redesign processes to keep pace with the demand. To take an example, what should be the degree of automation (semi-automated or fully automated), types of production facilities (assembly line, job-shop or intermittent), etc., can be assessed through aggregate demand analysis. Similarly, using long-run estimates, capacity planning is also done to decide about expansion of capacity.

Scheduling the system is done to ensure the best use of the existing conversion process. It requires a short-run demand estimate. Scheduling of job can be more effective once we are able to forecast demand accurately. Similarly, optimum manpower requirement, rate of production, etc., can also be assessed using forecasting technique. Demand forecasting is also necessary to control the system as it helps to control inventory, production, manpower and total costs.

However, demand forecasts alone may not always be effective in planning and controlling operational decisions. Some organizations also use technological and economic forecasts to combine with their demand forecasts for achieving accuracy in their decisions. Such forecasts are usually done by retaining experts, and these will not be within the purview of our discussion.

To secure orders and to execute those to the customers' satisfaction are the two primary objectives of a manufacturing organization. Production planning has been discussed in detail in this chapter.

Planning involves the decision on how the production is to be carried out. Scheduling assists in creating a timetable and routing production tasks. Dispatching gives the authority to start the work by obtaining the required tools, materials and items for production. Loading work timetables are created for an operator or machine according to the plan. This is also a control function, which ensures that plan objectives are met by the production department.

In the preceding chapter, we have discussed the basics of the production management function, clearly identifying the production planning and control as a vital element of the entire process. The scope of production planning and control goes far beyond the activities of the production department.

## PRODUCTION PLANNING

Securing orders and executing those to the customer's satisfaction are the two primary objectives of a manufacturing organization. Production planning and control by definition is the management of the process of executing orders. This process includes Planning, Scheduling, Dispatching, Loading, Progressing and Controlling.

Once the product is designed, the production manager needs to put together plans for manufacturing the product. To manufacture the end product from the part prints, product prototype or drawing, a production manager has to develop and follow a streamlined process of sequence of operations. These include the selection of tools and equipment for manufacturing processes to attain the desired quality levels and plans to achieve economy in operations. This function is also known as *process engineering*.

Process engineering differs from product engineering and is the function that follows it. As a product engineer, the production manager develops experimental designs and models, to test their utility, before making the part prints of the product.

Production planning is defined as a systematic way of determining manufacturing methods for a product so as to achieve both economy and customers' satisfaction. It broadly covers identifying, devising and specifying tools, equipment and processes to convert raw material into the finished product.

### Functions of Product Planning

- Determining the manufacturing process
- Deciding the sequence of operations
- Ascertaining the requirement of equipment, tools and gauges
- Outlining the norms for implementing change in process, tooling or equipment when drawings or part prints need to be altered
- Assisting in Product Design development

### Scope of Production Planning

On the basis of the above-mentioned functions, the scope of a production plan can be understood:

1. Identify and state the purpose of production—This should include the item name and code of the product, the quantity, volume or lot sizes, and raw material specifications, etc.
2. Sequential list of operations—This should include cycle time for completing the production process
3. List of technical specifications, for the different manufacturing stages as well as for quality control
4. List of equipment, machines, tools, gauges, jigs, dies, fixtures, etc., required for the different stages of production
5. List of specifications to be followed to achieve optimum performance standard, e.g., cycle time, set-up time, output level, etc.

### Steps in Production Planning

Careful planning and adherence to procedure can help production managers resolve problems that are likely to be encountered. These steps are as follows:

1. Clear definition of the requirements and conditions of the production process
2. Allow for continuous improvement in the production process
3. Create a list of all the basic operations in the process
4. Determine the most economical and efficient manufacturing methods
5. Create a detailed list of all equipment required
6. Decide sequence of operations
7. Identify gauging requirements

*Production planning* and *process planning* are terms used to define the same function in different organizations. Similarly, organizations also tend to use *Production planning* and *production control* interchangeably. Yet, here there is a small difference since production control is the execution of the production plan. This can be better understood once we define the objectives of production control.

### OBJECTIVES OF PRODUCTION CONTROL

1. To submit good delivery dates to customers
2. To achieve on-time deliveries
3. To make optimum use of manpower and machinery

4. To ensure Work-In-Progress (WIP) remains at minimal levels
5. To eliminate production delays and changes in the production plan
6. To build database for proper planning

### FUNCTIONS OF PRODUCTION CONTROL

From the objectives listed above, we can also derive the possible functions for production control. They are as follows:

1. Basic planning for developing policy decisions, stock holdings, delivery periods for customers, etc.
2. Pre-production planning that includes capacity planning and also controlling the receiving of orders
3. Ordering of make-and-buy items including direct ordering, requirements planning and stock control
4. Manufacturing control, including:
  - (a) Shop load analysis
  - (b) Shortage control
  - (c) Avoidance of potential delays
  - (d) Production scheduling
  - (e) Maintenance of progress records
5. Inventory management and store keeping

Organizations that offer competitive delivery dates to their customers are bound to attract more business and show a healthy growth. When making such offers, organizations have to take into consideration the sequence of activities associated with manufacturing and delivering the product. This production chart then needs to be matched with the quoted delivery period. To avoid making unrealistic commitments on delivery dates, there is a need to balance factory capacity with load. This is done through order intake control. Balancing factory capacity with load is not possible in isolation. Systematic capacity planning is done by forecasting the volume of business and adjusting the factory capacity with the projected load.

However, the task doesn't end here. Continuous and systematic efforts need to be maintained to ensure on-time deliveries. Some reasons for not meeting the delivery dates could be:

- (a) Insufficient manufacturing capacity
- (b) Scarcity or non-availability of materials, tools, fixtures, etc.
- (c) Inadequate specifications or instructions
- (d) Unforeseen circumstances, e.g., breakdown of machinery, absenteeism, labour problems, quality issues, etc.
- (e) Production sequence not meeting plan requirements

Ordering, which involves the decision on make or buy, requirements planning and stock control, is the function that ensures material availability at the right time. In cases where confirmed orders for the manufacture of specific products in specific quantities are received, the direct ordering technique is used. For situations in which the same material is used for the manufacture of goods for different customers, the requirements planning technique is used. This is

followed by an assessment of the future demand for the same material. Analysing historical demand trends and taking averages maintain stock control. To reduce the frequency of stock-outs, the shortage control procedure proves efficient in stock control. This involves a regular cheque on the availability of material a few hours or days before they are issued from the store. This technique also helps in balancing the stock and work-in-progress.

The shop load analysis technique proves useful in getting the optimum use of plant and manpower. Load on each section when balanced with capacity, helps us to identify under and overload situations. As a result, plant and manpower resources can be redeployed to balance the distribution of load and ensure optimum utility.

Pre-emptive action needs to be taken to reduce possible delays caused by unforeseen circumstances like machine breakdown, labour unrest or rejection. Routine preventive maintenance makes provision for delays caused by absenteeism or rejection. It also helps in identifying reasons for the delay and measures that could alleviate the problem.

Frequent absenteeism can be tackled by boosting the morale of workers. Otherwise, proper production scheduling can reduce production delays.

The last important function of production control is that of maintaining the MIS records, gathering data and building a historical database. This could form the basis of future organizational and production planning successes.

To sum up, the basic functions of production control can be broadly classified as:

- Planning
- Scheduling
- Routing
- Dispatching and Progress Control

### ROUTING

The final production planning for a plant is fine tuned at different stages. Routing specifies which work stations are involved in the manufacture of different products, product parts or sub-assemblies. This is a very crucial part of capacity planning. It is routing that makes product traceability possible, if required, which by fixing responsibility also contributes to product quality. Routing sheet or route sheet is extensively used for product traceability in ISO documentation.

A route sheet for a tea blender that markets packaged tea under a brand name and gets supplies both from its own gardens and from the auction market could typically be:

Lot No.	Description	Grade	Qty (in Kgs)	Source
SJ 1000	Good	BOP	1000	P-1
SJ 1005	Fair	BPSM	500	P-4
SJ 1002	Bad	PD	250	P-1
SJ 1003	Good	CD	500	P-2

(Continued)

Lot No.	Description	Grade	Qty (in Kgs)	Source
SJ 1001	Poor	SBP		
SJ 1004	Good	D-1	300	P-3
AR 1006	Good	OF-1	400	P-4
AR 1008	Fair	BOP	500	TT-1
			500	WM-2

Notice the Lot No. on this route sheet. Each one begins with alphabets and is followed by a control number. The alphabets specify the lot's point of origin, e.g., here in the above sample, 'SJ' stands for Sonajuli, the name of the tea garden for which this route sheet has been planned. 'SJ' has a number of processing units, as indicated by the Source column. Lot nos that are prefixed with AR are those of tea purchased from the 'Auction Route'. Even for these lots the source is available. 'TT' and 'WM' represent the tea gardens from where they are sourced with the numerical specification of the processing unit code. The description column gives the quality level of the tea, determined on inspection by tea tasters on factors such as liquor, colour and flavour. Grades are industry codes for different kinds and sizes of tea, e.g., BOP is Broken Peokoe (Small), PD is Peokoe Dust, CD is Churamani Dust, etc.

Manufacturing begins from the dispatching phase of production planning and control, when the job and material orders are released. These orders put into action the operations of the Master Production Schedule (MPS). For jobs that comprise of several individual parts, orders are dispatched in the form of job cards. Dispatch can either be centralized or decentralized, as per the organizational structure and involves:

- Checking material availability
- Ensuring all drawings, part lists, material lists specifications, process instructions and production aids are readily available
- Acquiring quality control instructions for inspections, checking schedules, etc.

The main activities involved in dispatch are as follows:

- Work assignment to machine and shop floor
- Assign responsibility for issue of materials, tools, gauges and fixtures to stores and other departments
- Distribute forms to gather information on production, cost data, payroll, etc.
- Allocate responsibility for progress monitoring and change control authority in unforeseen circumstances

### AGGREGATE PLANNING

While the primary objective of the Production Control department is to achieve organizational efficiency in production, by planning and scheduling operations; it also has the responsibility of intermediate and long-run planning. This kind of planning is closely related to demand forecasting, adjustments in production capacity, manpower requirements, timing of investments, new production facilities, hiring sub-contractors, etc. It cannot be planned for individual product lines and

has to follow an integrated approach for the organization as a whole. This is what is known as **aggregate planning**.

Aggregate planning works to make the optimum use of organizational resources to meet demand forecast. It has its focus on the collective levels of capacity and demand of an organization and plans quantity and timing of output for medium and long-term periods.

While preparing an aggregate plan for any organization, the following objectives need to be met:

- To provide levels of output, inventory and backlogs in keeping with the organization's comprehensive business plans
- To balance resources with load for optimized capacity utilization
- To maintain a consistent approach in manpower utilization in keeping with organizational policy on hiring, overtime, layoffs, etc.

Organizations use different approaches when they make aggregate plans, varying the number of manpower deployed, the inventory levels or sub-contracting. Each approach has its inherent advantages and disadvantages.

### Steps to be Followed in Aggregate Planning

1. To begin, it is necessary to decide on the level of aggregation that is required. Is it required across all product lines (for organizations with multiple product lines) or only for one? Then we need to take into account the kind of capacity available, demand of the products, timing of investment, manpower requirement (including layoffs, specializations and flexibility for cross-sectional jobs), etc.
2. Then we need to determine the measures to be taken on production and capacity. These could be computing the required man-hours, direct labour costs, number of units (weight or volume) produced, value of production (or capacity), etc.

So in effect, aggregate planning is the means of balancing capacity management with demand management. Changing manpower, varied working hours (overtime or time reduction), need for subcontracting (to off-load jobs), new equipment requirements, etc., are some factors that need to be taken into account for effective capacity management. Factors that affect demand management are new product launches, sales promotional activity, pricing, etc.

Aggregate plans that are made taking into account controllable variables, such as employment, idle time, overtime, part-time, plant capacity, inventories, sub-contracting, back-orders (where customers are willing to wait for delivery), etc., are those that have adopted pure strategies to account for fluctuations in demand and uncertainties of the production process.

### Aggregate Planning Methods

As mentioned earlier, methods for aggregate planning differ across organizations. Yet the one constant method is that the top management always provides the basic guidelines to work on. Effective aggregate plans usually follow the guidelines mentioned below:

1. Consult organizational policy on controllable variables
2. Apply proper forecast technique as basis for the plan

3. Determine the correct units of capacity
4. Maintain a stable workforce
5. Manage inventories efficiently
6. Build flexibility in plan to adapt to future changes
7. Evaluate and check plans at regular intervals

### MASTER PRODUCTION SCHEDULE (MPS)

To simply put, the MPS further breaks down the aggregate plan in terms of specific items to be produced in different time periods. If the aggregate plan specifies the number of motors to be produced each month, the MPS details out the different types and sizes of motors to be produced in different months. The MPS, therefore, controls the production activities after the formal production plan is made setting down the requirements for capacity and materials.

Type, volume and component lead times of products govern the time intervals specified in an MPS. This can vary from one week to several months. Once the MPS is finalized, it is updated from time to time keeping pace with the progress or changes, if any, in the production schedule. This needs to be done frequently, adjusting to changes required, to avoid affecting the MPS.

### Functions of MPS

The functions of an MPS are as follows:

1. To convert aggregate plans into specific end items
2. To assess alternative schedules
3. To finalize material requirements
4. To determine capacity requirements
5. To focus priorities
6. To optimally utilize the available capacity

### MPS Methods

1. Start from an aggregate plan
2. Identify and schedule common modules wherever possible
3. Load facilities realistically
4. Ensure timely release of orders
5. Closely monitor inventories
6. Agilely reschedule as and when required

### CAPACITY AND MATERIAL REQUIREMENT PLANNING

The material requirement planning (MRP) technique makes it easier to decide the quantity and timing for procuring materials as per the MPS. While capacity requirement planning (CRP) helps in determining the capacity requirement of manpower and machines to achieve the objectives set by MPS and MRP. The technique that integrates all managerial functions such as finance, marketing, personnel and engineering with production planning and control is MRP-II. Nowadays, with the help of computers these techniques are used more effectively.

and efficiently. These days, enterprise resource planning or ERP software is widely used in organizations across the globe.

### CAPACITY PLANNING

Capacity planning is done to estimate the requirements of machines and manpower so as to achieve the production targets. It helps to determine capacity and adjustment of capacity matching resource availability, to cope with demand fluctuation. With a stable demand pattern, the task of capacity planning becomes easier, while with a fluctuating demand, the task becomes complicated for obvious efforts required to the optimal utilization of available resources or new resource acquisition, as may be case. Excess capacity would minimize productivity; whereas, under-capacity would put strain on customer services and long-term growth and profitability of the organization. For effective capacity planning, production and operations managers need to consider factors like, machine standards, production cycle time, labour productivity, multiplicity of shifts, plant efficiency, scheduling delays, maintenance problem, power failure, absenteeism problem, other eventual manufacturing problems, like, improper design, inherent process bottlenecks, unavoidable rejection, etc. In addition, capacity planning decision also considers the scope of job sub-contracting, make-or-buy decision, manpower inventory, manpower planning, etc. The whole exercise ultimately helps to compute the available machine and man-hours, matching the production target.

For better comprehension, we can list the factors as under:

**Identify Items to be Manufactured for both the Present and in the Near Future:** This identification process is quite simple since the company's order booking position clearly spells out these details. However, more dynamic production and operation manager may even keep in view the market sentiments and perspective plan documents of the organization.

**Determination of Standard Output Information:** Standard output rate for each job or operation can be made available from machine literatures, which indicate the cycle time for each job unit. But this may not be always correct, as it is done based on the predetermined motion time standard. Many organizations, which have considered machine literatures' cycle time as the standard time for compensation planning, are now experiencing difficulties for obvious labour unrest for improper job correlation. Therefore, standard output rate needs to be determined by evaluating the organization's specific standard time duly carrying out the time study. Route sheet or process sheet to a great extent can supplement even efforts but may not by itself be able to speak the truth.

**Determining Quantity to be Manufactured:** This is also another important factor for capacity planning.

**Labour Efficiency Rate Determination:** This can be determined along with the standard output rate determination by carrying out time study. Selection of qualified worker (as sample) and the decision on the performance rate are some of the important issues involved in this process.

**Plant Efficiency Factor:** Determination of plant and machine efficiency duly considering the idle time is also important for effective capacity planning. Machine idle time increases due to various reasons like scheduling delays, breakdown, preventive maintenance, production change-over (which increases set-up time).

etc. Work sampling studies can make this process simple. However, the actual rate of efficiency varies from machine to machine and organization to organization.

**Multiplicity of Shifts:** It is also another important decision for capacity planning. However, such a decision can just not be taken without adequate economic analysis. Ideally, two-shift work is better than single or three-shift work for obvious productivity and cost constraints.

**Scope of Subcontracting:** Sub-contracting means job off-loading to the established vendors. Conventionally, low-technology jobs are subcontracted by the companies to reap the cost advantage. However, this decision also is taken by a careful cost-benefit analysis. Subcontracting decision to a great extent also depends on organizational policies.

### Illustration on Capacity Planning

Sonajuli Tea Estate has made available following information on grading and packing of per Kg 'made tea' in a day.

Sl. No.	Job description	Standard time Required per Kg (in minutes)	Average Qty required per month
1.	Arranging the made tea on wire mesh	2	1300
2.	Running of machine	2	1300
3.	Storing the Graded tea in aluminum bins	3	1300
4.	Printing the graded tea in the packets of various sizes	5	1300

For all the above operations, the use of wire meshes is compulsory as it helps more accurate grading through subsequent machine runs. Based on the above information, estimate the requirement of wire meshes and manpower, assuming labour efficiency rate of 75 per cent and plant efficiency rate of 80 per cent. Assume a particular wire mesh can run for 100 hours a month, as it requires a thorough clearing every week. Nature of job does not warrant multi-shift working and one operator can operate two machines.

### Solution

1. Compute the total required hours by multiplying standard time per Kg (in hours) by average monthly requirement. Since, the standard time per Kg is given in minutes, to arrive at total working hours, it should be divided by 60.
2. Since labour efficiency is 75 per cent, running of wire meshes, i.e., the equipment is restricted to the extent of 75 per cent and, thus, the above value is needed to be divided by 0.75 to arrive at the adjusted equipment running hours.

3. Similarly, to arrive at capacity hours considering 80 per cent utilization of the wire meshes, the adjusted equipment's running hours are needed to be divided by 0.80.
4. Finally, the requirement of the wire meshes, i.e., the machine is decided by dividing the adjusted capacity hours by available hours per machine, which is 100 hours per month, as indicated before. Refer to the Table 'Calculation of Machine and Manpower Requirement' on the following page.

Therefore, the number of operators required would be *two* since, the net requirement of wire meshes is four and one operator can operate two wire meshes/machines.

### PROCESS OF CAPACITY MEASUREMENT

For an organization, engaged in manufacturing of a single product or homogenous products, capacity measurement is relatively simple, as it can be measured in terms of number of units per unit of time, i.e., daily, weekly, monthly or annually. To take an example, a scooter manufacturer's capacity can be understood in terms of number of scooters produced in a month. While for a shoe manufacturer, such measurement can be done in terms of number of pairs produced in a month. However, for organizations engaged in the manufacture of multiple products, capacity measurement in terms of definable units per unit time, becomes difficult for the obvious sharing of common manufacturing facilities. In such cases, capacity may be defined in terms of available labour hours or machine hours. To take an example, for a job-shop or an intermittent type production system, capacity can be measured in terms of labour or machine hours.

### DIFFERENT TYPES OF CAPACITY

Capacity limits the capability of the organization. Although such capability limitation can be overcome to some extent by introducing multi-shifts or by subcontracting, but, by and large, such capacity can be quantitatively described as follows:

#### Licensed Capacity

This denotes the actual capacity licensed by the concerned government authorities. Before starting the actual production, an organization needs to declare such required capacity, which government authorities finally vouch after due inspection of available facilities in the organization. In reality, a particular organization may obtain higher licensed capacity, keeping in view the future expansion requirements.

#### Installed Capacity

It represents capacity in terms of machines actually installed. Machines procured for installation have some defined capacity, as provided in their printed literatures. Summation of such capacity gives a total installed capacity. As explained earlier, installed capacity may not be exactly at the same level of licensed capacity for the obvious less installation of the plant facilities by the organization, without adequate commercial run.

Calculation of Machine and Manpower Requirement							
Sl. No.	Job description	Standard time/Kg (in minutes)	Average requirement per month (in Kg)	Total hours required for given qty	Equipment running hours @ 75% labour efficiency	Capacity hours @ 80% machine utilisation	Machine requirement on single shift
1.	Arranging the made tea on wire mesh	2	1300	43.33	57.77	72.22	.72
2.	Running of machine	2	1300	43.33	57.77	72.22	.72
3.	Storing of graded tea in Aluminum bins	3	1300	65	86.66	108.33	1.08
4.	Putting the graded tea in tea packets	5	1300	108.33	144.44	180.55	1.81

Total requirement of the wire meshes = 4.33

Net requirement of wire meshes = 4

### Rated Capacity

This denotes the actual performance efficiency of the machines, which can be understood after trial run. Obviously, the highest production rate becomes the benchmark. However, deciding the capacity rate based on the single one-time highest achievement may not be always correct. It is necessary to assume the average of performance rate of machines over a time period for more effective rating decision.

### MATERIALS REQUIREMENT PLANNING (MRP)

MRP is a scientific technique for planning and scheduling materials requirement for production. It combines inventory control with the production planning under dependent demand condition, utilizing inputs from MPS, Bills of Materials (BOM) and Inventory Status Report (ISR). MPS, as explained earlier, expresses the aggregate plan in terms of specific items. BOM expresses how the end product is to be manufactured, duly detailing all subcomponents or sub-assembly items, their sequence and quantity, work centres performing the respect job sequence, etc. ISP, on the other hand, provides a detailed information on inventory status of every item. Such status report also contains information on safety stock level, procurement lead time, vendor rating details, etc.

MRP helps in reducing inventory and lead time (both for production and delivery), giving more realistic and achievable delivery schedule to customers and finally helps in increasing efficiency.

A typical MRP Report for a single item may look like this:

Item Code	XLM 2169 Seat Cushion							
Lead Time	Two Weeks							
Report Date	0 week							
Particulars	Week Nos.							
	1	2	3	4	5	6	7	8
Gross requirements				200				250
Scheduled Receipts								
Available on hand (at the end of the week)	25	25	25	25				
Net requirement					175			250
Planned order Release (beginning of the week)		175				250		

MRP Report for Seat Cushion

### MANUFACTURING RESOURCE PLANNING (MRP-II)

We have seen that MRP only helps in Scientific Production Planning, synchronizing input information from MPS, BOM and ISP. MRP-II, on the other hand, synchronizes all aspects of the business plan, duly coordinating all functional areas of business, like Marketing, Materials Manufacturing, Finance and Personnel. The process helps to integrate business plans with production plan using a closed-loop MRP.

### PRODUCTION-RELATED FORMS

To enforce proper production management and control, many organizations nowadays make use of computer-generated production reports and forms. Some of the computer generated forms that are related to production are illustrated here.

#### Weekly Production Schedule Form

KMIS			
Module	Fabrication	Form	Weekly Schedule
Description	This form is used to prepare Weekly Schedule in Fabrication Section		

WEEKLY SCHEDULE					
Weekly Schedule No.		WK/2002/FY001/0009		Date Of Preparation 11/02/2002	
G 1st Week		C 2nd Week		C 3rd Week	
Month: March		Year: 2002			
Sl	Product Code	Description	Actual Qty	Additional Qty	Remarks
1	PD0066	APL 72X60X4	30		0 Ref: IC/2002/FY001/00009, IC
2	PD0079	APL 78X72X4	15		0 Ref: IC/2002/FY001/00014, IC
3	PD0116	SDL 78X60X4	56		0 Ref: IC/2001/FY001/00190, Re
4	PD0977	SDL 84X72X4	32		0 Ref: IC/2001/FY001/00113, IC
5	PD1826	SDL 84X60X4	3		0 Ref: IC/2001/FY001/00570, Re
6	PD0066	APL 72X60X4	30		0 Ref: IC/2002/FY001/00009, IC
CLICK HERE TO EDIT ITEMS IN THIS WEEKLY SCHEDULE					
Prepared By: DILIP KUMAR M			Approved By:		
Add	Edit	Approve	Use	Cancel	Close
First	Prev	Next	Last	Find	

## Job Process Details Form

KMIS	
Module	Fabrication Form Job Process Details
Description	This form is used to enter the machine-wise job process details in Tape Edge Section

**Job Process For Tape Edge Section**

Job Process No: SE010/2002/FY001/0002 ... Job Order No: SE010/2002/FY001/0002

Contractor Name: RAGHAVENDRA ENTERPR Date: 10-01-2002

Address: (ANCILLARY UNIT)  
JBI ESTATE  
YESWANTPUR Shift:

☐ Close the Job Order

Product	M/C 1	M/C 2	M/C 3	M/C 4	M/C 5	M/C 6	M/C 7	M/C 8	M/C 9	M/C 10
SDL 72X30X4	50	50	50							
SDL 78X36X4	44	50	50							
SDD 72X35X4					15	15				

Print

First  
Prev  
Next  
Last  
Find

Add Edit Delete Approved List Cancel Close

## SUMMARY

To secure orders and to execute those to the customers' satisfaction are the two primary objectives of a manufacturing organization. Production planning and control by definition is the management of the process of executing orders. This process includes planning, scheduling, dispatching, loading, progressing and controlling. Once the product is designed, the production manager needs to put together plans for manufacturing the product. To manufacture the end product from the part prints, product prototype or drawing, a production manager has to develop and follow a streamlined process of sequence of operations. These include the selection

of tools and equipment for manufacturing processes to attain the desired quality levels and plans to achieve the economy in operations. Production planning and process planning are the terms used to define the same function in different organizations. Similarly, organizations also tend to use production planning and production control interchangeably. Apart from about the aggregate planning, master production planning schedule and capacity requirements planning.

## Key Words

**Scheduling:** Scheduling is the system to ensure best use of the existing conversion process. It requires short-run demand estimate. Scheduling of job can be more effective once we are able to forecast demand accurately.

**Production Planning:** Production planning is defined as a systematic way of determining manufacturing methods for a product so as to achieve both economy and customers' satisfaction. It broadly covers identifying, devising and specifying tools, equipment and processes to convert raw material into the finished product.

**Shop Load Analysis:** The shop load analysis technique proves useful in getting the optimum use of plant and manpower. Load on each section when balanced with capacity, helps us to identify under and overload situations. As a result, plant and manpower resources can be redeployed to balance the distribution of load and ensure optimum utility.

**Routing:** Routing specifies which work stations are involved in the manufacture of different products, product parts or sub-assemblies. This is a very crucial part of capacity planning. It is routing that makes product traceability possible, if required, which by fixing responsibility also contributes to product quality. Routing sheet is extensively used for product traceability in ISO documentation.

**Aggregate Planning:** Aggregate planning works to make the optimum use of organizational resources to meet the demand forecast. It focuses on the collective levels of capacity and demand of an organization and plans quantity and the timing of output for medium- and long-term periods.

**Master Production Schedule:** MPS further breaks down the aggregate plan in terms of specific items to be produced in different time periods. If the aggregate plan specifies the number of motors to be produced each month, the MPS details out the different types and sizes of motors to be produced in different months. The MPS, therefore, controls the production activities after the formal production plan is made by setting down the requirements for capacity and materials.

**Capacity Planning:** Capacity planning is done to estimate the requirements of machines and manpower so as to achieve the production targets. In helps to determine the capacity and the adjustment of capacity matching resource availability, to cope with the demand fluctuation. With a stable demand pattern, the task of capacity planning becomes easier, while with fluctuating demand, the task becomes complicated for the obvious efforts required to the optimal utilization of available resources or new resource acquisition, as may be the case.

**Materials Requirements Planning:** MRP is a scientific technique for planning and scheduling materials requirement for production. It combines inventory control with production planning under the dependent demand condition, utilizing inputs from MPS, BOM and ISR.

## REVIEW QUESTIONS

1. Define production planning. Explain its functions and scope.
2. What are the steps involved in a production plan? How is a production plan different from production control?
3. What is routing? Using a route sheet how can we establish product traceability?
4. What is aggregate planning? What objectives do we achieve using an aggregate plan?
5. Explain the term capacity planning. What are the factors that we consider in a capacity plan?
6. Short Notes:
  - (a) Ordering
  - (b) Installed Capacity
  - (c) Rated Capacity
  - (d) MRP-II

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books
2. Konz, Stephen. 1983. *Work Design: Industrial Ergonomics*, 2nd edition. New York: John Wiley & Sons.
3. Chase, Richard B., Nicholas J. Aquilano, and F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.

# New Product Planning and Development

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand new product planning and development
- learn about product or service life cycle analysis
- know the process selection
- comprehend the break-even analysis

## INTRODUCTION

New product planning and 'new product development' come under the purview of marketing management. Planning and development require the active cooperation of the technical wing of the company, viz., the Research and Development and Engineering departments. *Product selection* is choosing the products that match market requirements. This covers not only new product planning and new product development but also covers improvement in existing products by addition/deletion of product features in keeping with changes in demand.

Thus, product selection process involves the following two activities:

- Introduction of new products
- Improvement of existing products

New product development or selection is required for any of the following:

- To combat sluggishness in the growth rate of the organization
- To replace short-lived products
- For the optimal utilization of surplus capacity in terms of available physical facilities, managerial expertise and workmen skills
- To deploy manpower-rendered surplus due to organizational restructuring after technology changes

- To use the surplus funds and increased borrowing power of the organization
- To enhance the image of the organization and improve the market visibility with new product ranges
- To meet the new requirements of the customers

However, improvement of existing products is done for the following reasons:

- To give existing products a new look
- To utilize existing equipment and manpower
- To satisfy immediate needs of the customer
- To increase sales by providing new advantages like more functionality, maintainability, multiple utility satisfaction, etc.
- To increase the market share
- To develop customers' brand loyalty
- To achieve economies of scale by producing bulk quantities
- To increase cost efficiency

The first four reasons are short-term objectives and the others are long-term objectives for improvement of existing products.

### NEW PRODUCT SELECTION OR DEVELOPMENT PROCESS

This is a complex process, which begins with idea generation and continues till commercialization. The process requires coordination between various departments. The process can be broken up into the following stages:

#### Exploration

New ideas are sought from the sales force, since that is the department which is in constant direct contact with customers. The analysis of customer needs also takes into account competitors' products and services. New ideas are also generated from the consultants, shareholders, management employees, report on foreign markets and products, trade journals, R&D laboratories, other research, etc. However, technical feasibilities and market potential have to be kept in mind while examining new ideas.

#### Screening

While choosing the most effective ideas, guesswork or hunches are not reliable. To ensure a more scientific and less risky selection process, it is necessary to keep in mind all possible quantitative, as well as, qualitative information. Keeping in mind the organizational objectives and available facilities, the following must points be considered while selecting an idea—

- Market potentiality
- Technical feasibility of the idea
- Does the idea fall under any intellectual property rights or patent regulations?
- Raw material supply position—at present and in the future

- Do existing production facilities and resource availability remain suitable for commercialization of the new idea?
- The level of investment required
- Can the company generate this level of required investment from internal sources?
- If borrowing is a must, cost of borrowing is a factor
- Does profitability projection analysis suggest adequate return on investment?

Profitability projection study can be made using following formulae:

$$(a) \text{ PVI} = \frac{\text{CTS} \times \text{CCS} \times \text{AV} \times /L}{\text{TPC}}$$

Where,

PVI = Project Value Index

CTS = Chances of Technical Success, calculated on a rating scale, which may be arbitrary, say 0 to 10

CCS = Chances for Commercial Success, on a scale, say 0 to 10

AV = Annual Volume of total sales in units

P = Profit per unit

L = Life of Product (in years)

TPC = Total Project Cost

However, a more simple approach, as under, may be considered to arrive at the net probable return per rupee:

$$(b) I = (PN/C)$$

Where,

I = Index of relative worth

P = Overall probability of commercial attainment of goal

N = Estimated net return for an arbitrary five-year period

C = Estimated future cost

In addition, point system and graphs also can supplement the profitability projection analysis of new product.

**Business Analysis:** At this stage, technical and economic factors, like manhours, cash flow, inventory holding, etc., are analysed to evaluate commercial feasibility. This will ultimately facilitate the budgeting process.

**Development:** A working model is developed at this stage to evaluate the practicability of the new idea, by studying the acceptability of customers to the working model. Most companies use *product life cycle model* at this stage.

**Testing:** Redesigning of the working model into a production prototype and testing the market before bulk production.

**Commercialization:** At the final stage of a new product planning, decisions have to be made whether to make or buy components; production methods have to be developed; distribution networks activated and the new product has to integrate with the organization's normal activity, and satisfactory sales volume and profitability have to be achieved.

## PRODUCT/SERVICE LIFE CYCLE ANALYSIS

This analysis covers the pattern of demand throughout a product's life span. It similarly identifies the patterns and stages of the useful life span of a process. This concept, which is commonly used in marketing management literature states that a product is supposed to go through a number of stages, as shown below:

### Stage 1

This is the introductory or launching stage when the product/service has to win a place in the market and prove its worth. Sometimes, this stage is broken into two stages, product development and testing and introduction. Here, however, this is taken as one stage.

### Stage 2

Once the product/service has general acceptability it passed to this stage, which is the rapid development phase. At this point, manufacturing and distribution system need to be streamlined, through method study, work measurement, value engineering, ergonomic or human engineering techniques with suitable changes in technology, if required. At this point, when the demand for the product/service peaks, it calls for an increase in output volume by the organization.

### Stage 3

This is called the *steady stage*. During the rapid development phase, the competitors try to capture market share by introducing similar products/service. Due to this, the growth rate of the product/service slows. This is also termed as the *established stage*.

### Stage 4

This is the declining or phase-out stage in the life cycle. At this point, the demand for the original product/service dies out or disappears from the part, either due to changes in customer taste or due to any technological breakthrough.

The different stages in a product/service life cycle can be shown in the form of a graph, as in Figure 17.1.

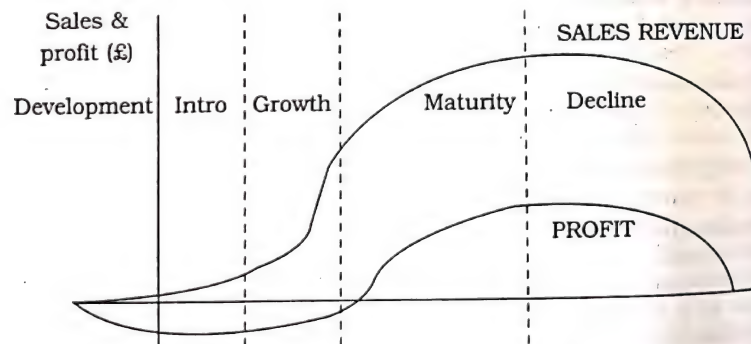


Figure 17.1: Stages in Product/Service Life Cycle

## PROCESS SELECTION

The manufacturing process is of converting of inputs into outputs and adding value to the products. It is the most important part of production/operation function and the appropriate process selection involves getting the desired output and quality while maintaining cost efficiency. This is why appropriate process selection is such a vital strategy decision. Once a process is selected and implemented, it is difficult to change it due to the obvious cost implication. The choice of process would depend on various factors, but the two basic objectives are of paramount importance, viz., meeting specifications requirement and achieving the cost effectiveness.

### Factors Influencing Process Selection

The factors that affect the process selection are discussed in the following:

#### Volume and Variety

If the degree of repetitiveness is high, then a continuous production process is indicated to ensure the higher output volume at a higher speed. However, organizations that produce a wide variety of items would require multi-skilled workers, general-purpose machines and complex production planning and control systems. Here, a job-shop type (intermittent) or a batch type of production is more suitable.

#### Capacity of the Plant

The choice between a job-shop type and mass production also depend upon the projected sales or output volume. Fixed costs are high in the continuous process, and variable costs are high for job-shop type process.

#### Flexibility

Flexibility allows an organization to satisfy varied needs of the customer. When the flexibility of production is high, then the process needs to be an intermittent manufacturing process.

#### Lead Time

Faster deliveries, to a great extent allow an organization to remain a market leader, whereas, delays eventually cause decrease in the market share. To ensure adherence to delivery schedules, batch production process would be selected where there is a variety of products, and where there is uniformity there would be a mass production.

#### Economy of Scale

It is important to have an optimum utilization of machine and manpower to achieve cost efficiency in the production process. This is an aspect that has to be considered while selecting a manufacturing process.

#### Environment

Environmental issues are increasingly being considered, while selecting a manufacturing process. To take an example, plastic moulded butts are replacing

wooden rifle butts, and cold swaging process is in use for metal forming as it is more environment friendly.

No single criterion is sufficient to decide the process selection. Various manufacturing process will be discussed later in detail.

In addition to the above factors, organizations may also use cost-benefit analysis and break-even analysis to choose a given process.

Under cost-benefit analysis, the cost estimates are prepared for each of the alternative processes and the least cost alternative is chosen. The following costs are considered:

- Cost of materials
- Cost of unavoidable rejection (UAR)
- Cost of scrap arising
- Tooling cost
- Processing cost

### BREAK-EVEN ANALYSIS

Break-even analysis technique is widely used in production and operations management. It categorizes production costs into variable and fixed costs. Variable costs change with the volume of production, whereas, the fixed costs remain unchanged. Total variable and fixed costs are compared with the sales revenue to determine at which level of sales volume, sales value or production, the business makes neither a profit nor a loss, i.e., the break-even point.

Break-even analysis, therefore, suggests preparation of cost estimates for different available alternatives. Obviously for a given quantity 'N', the least cost alternative is selected. For determining the value of 'N', we use the following formula:

$$N = \frac{F_2 - F_1}{V_1 - V_2}$$

Where,

N = Quantity, cost for which is same for both the machines

F1 = Annual fixed cost for the first machine

F2 = Annual fixed cost for the second machine

V1 = Variable cost per 'N' unit for the first machine

V2 = Variable cost per 'N' unit for the second machine

If quantity to be manufactured is less than 'N', then obviously the process with the lower fixed cost is selected, or else when quantity to be produced is more than 'N', i.e., break-even quantity, the process with lower variable cost is selected.

Let us illustrate break-even analysis using following example:

#### Problem

Turning or machining job of a given component in a manufacturing process can be done using either a Centre Lathe or a Turret Lathe. The firm has received order for 1000 numbers from an Ordnance Factory, for meeting their urgent requirement of spares for the Bofors gun. There is no chance for repeat orders for the same,

New Product Planning and Development 371

the original supplier abroad has agreed to supply the spares in future with the improvement of diplomatic relationship. Different cost break-ups (in rupees) of the two machines are as:

Cost Details		
	Centre Lathe	Turret Lathe
Tooling up cost		
Labour cost per hour	300	600
Depreciation and other miscellaneous expenditures per hour	3	3
	12	18

The set-up time for Centre Lathe is 30 minutes, whereas, for Turret Lathe it is 100 minutes. The cycle time for processing a component is 15 minutes and 10 minutes respectively.

Suggest up to how many units Centre Lathe could be preferred over Turret Lathe? Also suggest that for 1000 numbers, which lathe is more preferred from the other?

#### Solution

Since, we have not been given the procurement cost for two different machines; fixed cost would be the set-up cost and the tooling cost or the machine. Assuming that machining is done in one lot, the fixed cost would be calculated as follows:

$$\text{Centre Lathe (F1)} = \text{set-up time} \times (\text{labour cost} + \text{depreciation (in hour)}) + \text{tooling cost} \\ = 30/60 \times 15 + 300 = \text{Rs } 307.5$$

$$\text{Turret Lathe (F2)} = 100/60 \times 21 + 600 = \text{Rs } 635$$

Variable cost would be, similarly, computed as follows:

$$\text{Centre Lathe (V1)} = \text{cycle time (in hour)} \times (\text{labour cost} + \text{depreciation per hour}) \\ = 15/60 \times (3 + 12) = \text{Rs } 3.75$$

$$\text{Turret Lathe (V2)} = 10/60 \times (3 + 18) = \text{Rs } 3.5$$

Applying the formula, therefore, we get the break-even quantity as under:

$$(635 - 307.5)/(3.75 - 3.5) = 327.5/0.25 = 1310 \text{ numbers}$$

Since the break-up quantity is higher than the required quantity of 1000 numbers, we could prefer Centre Lathe to Turret Lathe, as the fixed cost for the Centre Lathe is considerably lower than the Turret Lathe.

### Break-Even Chart

The break-even chart is a graphical representation of costs at various levels, with the change in sales and volume of activity (say, production). At the break-even point, the company neither makes profit nor incurs loss. The next graph indicates the intersection point 'P' at which level the total income (sales and revenues) just recoups the total costs (fixed and variable). Using this approach, we can define a break-even point as:

$$\text{Break-even Point} = \text{Fixed Costs} / (\text{Unit Selling Price} - \text{Variable Costs})$$

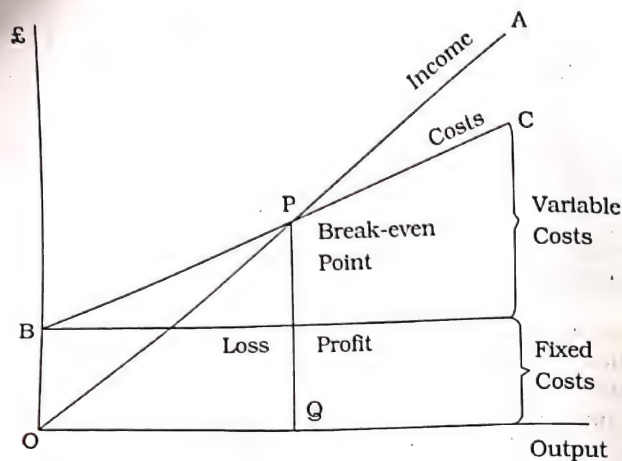


Table 17.2: Break-Even Analysis

Let us now explain the graph. QA point represents the income variation with respect to the changing level of production. OB is the fixed cost, which remains unchanged despite the change in the production volume. BC is the variable cost, which changes with respect to the change in production volume. At the low level of output, the total cost (fixed + variable) is more, for which the company suffers loss. However, with the increase in the volume of production the income exceeds the total costs, and the company can earn profit. The point of intersection, P, indicates total costs are exactly equal to income, i.e., the stage of no loss no profit.

### SUMMARY

New product planning and new product development although considered more relevant for the marketing management function, production and operations department play a crucial role in translating the plans into new products and services. Through systematic product/service life cycle analysis, organizations periodically identify the scope of developing new products and services, to remain competitive in the market. Once the new product and service are identified for development, the production department needs to consider the process duly studying the volume and variety, capacity of the plant, flexibility, lead time, economy of scale, environment, etc. Finally before implementation or streamlining the new product production, organizations also require performing the cost-benefit analysis and break-even analysis.

### Key Words

**Fixed Costs:** Fixed costs are those which do not directly relate to the level of production. Examples of fixed costs are: rent and rates, depreciation, research and development, marketing costs, administration costs, etc.

**Variable Costs:** Variable costs vary directly with the level of output. Such costs are raw materials, direct labour, fuel, etc. Revenue-related costs are commission, etc. Again variable costs can be classified into direct variable costs and indirect variable costs. Direct variable costs can be directly attributed to production. Indirect variable costs, on the other hand, cannot directly be attributed, as it changes with the production volume.

**Semi-Variable Costs:** Some fixed costs changes with the scale and complexity of business. With more people on the pay roll, organizations may require to maintain one independent HR department. Costs incurred are variable and part fixed.

**Process Selection:** The manufacturing process that converts inputs into outputs and adding value to the products. It is the most important part of production management function, as it produces the desired output maintaining the quality and cost efficiency.

**Business Analysis:** At this stage, technical and economic factors, like man hours, cash flow, inventory holding, etc., are analysed to evaluate commercial feasibility. This will ultimately facilitate the budgeting process.

**Commercialization:** It is the final stage of new product planning. Decisions like, make or buy, methods of production, distribution networks, integration of new product with normal activities of the organization, etc., are taken at this level.

### REVIEW QUESTIONS

1. Explain product selection and how it differs from process selection.
2. An automobile manufacturing company enjoys 30 per cent market share for their branded passenger car. The company observed that the sales volume almost remains stagnant for quite some time. As a production manager of the company, consider whether the company should go for a new product development or product improvement. Give justification for your answer.
3. Explain the main stages in new product selection.
4. Prepare the product life cycle of a hypothetical branded washing powder.
5. What are the factors that govern process selection?
6. How do cost-benefit analysis and break-even analysis assist in deciding about a process?
7. Short Notes:
  - (a) Service Life Cycle
  - (b) Profitability Projection Analysis
  - (c) Phase Out Stage
  - (d) Flexible Process
  - (e) Lead Time

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books.
2. Richard, B. Chase, Nicholas J. Aquilano, and F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
3. Schmenner, R.W. 1995. *Service Operations Management*. Englewood Cliffs, N.J.: Prentice Hall.

# 18

## Scheduling and Sequencing of Production

### LEARNING OBJECTIVES

*After reading this chapter, the student would be able to:*

- comprehend the definitions of production scheduling and sequencing
- understand the meaning of assignment or job loading
- know the concept of job sequencing
- be familiar with Johnson's rule, Gantt charts, PERT/CPM
- learn dispatching of the line of balance (LOB)
- appreciate the project management practices

### INTRODUCTION

Production sequencing or scheduling is the planning of production keeping in view various constraints at the organization level. Marketing department of any organization may book the orders, competing against others, but its ultimate production and delivery largely depends on the production or operations department. Sequencing or scheduling of production is done in a way, so that overall interests of every stakeholder (like, customers, suppliers, shareholders or the owners, etc.,) are safeguarded. To take an example with the same production facility, a company may cater to varied customers' needs. When orders are booked by the marketing department, they may desire to execute the orders one by one; the production department, however, needs to consider more holistically, keeping in view the machine interchangeability time, processing time, etc. For production schedule, various tools are used. In this chapter, we have discussed about all such tools.

### ASSIGNMENT OR JOB LOADING

Many organizations may have more than one facility available to perform a job. Hence, there is a need to make a choice between different alternative facilities. Jobs should be allocated making

cost-effective facility-job combination. One method that helps make the optimum decision on job scheduling is the *assignment or job loading technique*. Under this technique, the following steps are suggested to determine the optimal cost assignment of jobs to the machine:

1. From the given job-machine combination matrix, a revised matrix is needed to be prepared by allowing subtraction of smallest figure from all figures in the column.
2. The next stage requires performing the row subtraction in the similar manner, explained above, i.e., smallest number in any row is subtracted from all the figures in that row. Accordingly, a revised matrix needs to be developed.
3. At this stage, a further revised matrix is prepared to determine the minimum number of lines needed to cover all zeros.
4. If a minimum number of lines are not equal to rows or columns (at this stage), then this would not lead to the optimal solution, as many machines will then remain idle, and in that case, some lines may become redundant. Lines are the array of machines, and usually, in each line some operation or the other is carried out. In such cases, i.e., where it becomes necessary to make some lines redundant, it is further required to prepare a revised matrix.
5. To further revise the matrix (in case, the situation is as explained in Step-4), we require to add the smallest uncovered number of the earlier matrix to the numbers at the intersection of the covering lines and subtract it from other uncovered numbers, leaving other numbers as they are.
6. Finally, based on the revised matrix above, we can assign the jobs to machines, starting first with those where rows and columns have only one zero.

We will now explain all these steps using the following illustration:

*Example:* X & Co. has won an order for four jobs which can be executed using any of their four available machines. However, the manufacturing cost is different for different job-machine combinations. The following matrix depicts the problem facing the company. We have to find the best option to assign jobs to the machines to achieve cost effectiveness.

**MATRIX-A**

Jobs	Machines			
	1	2	3	4
W	8	4	7	14
X	15	12	9	3
Y	9	18	12	16
Z	10	20	15	5

*Solution:*

1. Following Step-1, we get the revised Matrix as under:

**MATRIX-B**

Jobs	Machines			
	1	2	3	4
W	0	0	3	4
X	7	8	0	11
Y	1	14	2	0
Z	2	16	5	13

2. Following Step-2, we get the revised Matrix as under:

**MATRIX-C**

Jobs	Machines			
	1	2	3	4
W	0	0	0	11
X	7	8	2	0
Y	0	13	4	12
Z	0	14	6	0

Following Step-3, we can determine the minimum number of lines required to cover all zeros, and the results indicate that the minimum number of lines required is *three*.

Following Step-4, we have to make redundant one line and make the corresponding machine idle, which will outweigh the benefits of cost effectiveness (that we aspire to achieve).

Looking at Matrix-C itself, we can verify that we can make one line, i.e., array of machines redundant, reducing the number of lines required from four to three. However, the number of jobs being four, this will not lead to an optimal solution. We, therefore, need to draw a revised Matrix-B, following the subsequent steps.

Following Step-5, therefore, we can draw the revised Matrix as under:

**MATRIX-D**

Jobs	Machines			
	1	2	3	4
W	2	0	0	13
X	7	6	0	0
Y	0	11	2	12
Z	0	12	4	0

It could be seen from the above Matrix-D that rounded numbers, i.e., 7 and 12 have not been changed, i.e., neither the smallest number has been added (they are not falling under intersection) nor the smallest number has been subtracted (being not uncovered).

After this, we make the final assignment, following Step-6. As explained in the step, we start selecting job-machine combination, looking at the Matrix-D, choosing the first job to that line/machine, where rows and columns have only one zero. Row 'Y' and column 1 have only one zero; hence, Job 'Y' is assigned to Machine-1. Thereafter, job 'W' is assigned to Machine-2; job 'Z' can be assigned to Machine-4 and job 'X' to Machine-3. Therefore, our final job-machine combination would be as under:

MATRIX-E

Jobs \ Machines	
W	2
X	3
Y	1
Z	4

### INDEX METHOD

Index method is applied to finite job loading cases. It is called finite because job loading is done according to the capacity of the machine. Under this method, the lowest time or the cost required by a particular job-machine combination is taken as the base and the indices for the others are prepared based on the base variation. While doing such allocation, the job with the lowest index is done first followed by the next job and so on. However, such allocation has to be done within the capacity of the respective machine, which should not be exceeded under any circumstances.

To take an example, we can illustrate the index method of job loading by slightly modifying the earlier example as shown:

*Example:*

Suppose X & Co. has now indicated the capacity of the individual machines (considering other job loads) in terms of hours available as under:

Jobs \ Machines	1	2	3	4
W	8	4	7	14
X	15	12	9	3
Y	9	18	12	16
Z	10	20	15	5
Hours available in each machine	14	15	13	10

*Solution:*  
We have solved this problem as under:

Jobs	Machines							
	1		2		3		4	
	Hour	Index	Hour	Index	Hour	Index	Hour	Index
W	8	2.00	4	1.00	7	1.75	14	3.50
X	15	5.00	12	4.00	9	3.00	3	1.00
Y	9	1.00	18	2.00	12	1.33	16	1.77
Z	10	2.00	20	4.00	15	3.00	5	1.00
Hours	14		15		13		10	
Available Hours	9		4		0		(5+3) = 8	
Allocated								

As you can see from the Matrix, Job Y has the lowest index in Line 1, and it is within the capacity; hence, it is allocated there. The next Job 'W' is, therefore, allocated to Line 2 and 'Z' to Line 4. Line 3 will remain idle. The table shows that the company can bag further orders to feed Line 3 and utilize surplus capacities of the other lines, as well.

### JOB SEQUENCING OR PRIORITIZATION

The sequencing method for the optimal loading decision has to be followed in all cases of infinite loading and in some cases of finite loading. Priority rules help in making the decision regarding which job has to be processed first, and in what order other jobs should be processed. This is applicable in a situation where there may be a number of jobs and one machine or where there may be 'n' number of jobs and two or three work centres (Johnson's Rule).

Job sequencing may follow any of the following rules:

#### Minimum Process Time Method (MINPRT) or Shortest Operating Time Method (SOT)

The first job scheduled is the job with the shortest process time, followed by the job with the next lowest process time and so on.

#### Due Date Method (DD Method)

Priority is given to the job with the earliest due date.

#### First Come First Served Method (FCFS)

The jobs are scheduled in the order that the company received them.

#### Longest Process Time Method (LPT)

The absolute reverse of the MINPRT method, as under LPT, the jobs with the longest processing time are scheduled first.

### Dynamic Slack/Remaining Operation (DS/RO) or Minimum Slack per Operation Method (MINSOP)

In DS/RO, we first calculate the *dynamic slack* (DS), which is the difference between due time and processing time and then divide this DS by the *remaining operation* (RO). Unless specified, RO will be assumed as one. The final scheduling of the job is done as per the ranking of DS/RO. Jobs with the lowest value are attended to first; similar ranking is given in the order of the next lowest and so on.

Which rule is the most appropriate depends on the average job lateness and the average number of jobs in the systems. The least job lateness will ensure customer satisfaction, optimum utilization of machine, reduced slack time, etc. The above rules enable an organization to choose the best option for job sequencing which causes the least job lateness or slack time.

Let us study the following example to understand the sequencing method:

*Example:* X & Co. has indicated the process time for four jobs with their respective due dates as under:

Jobs	Process Time (in days)	Due Date (in days from now)
W	5	12
X	6	18
Y	7	21
Z	10	14

Let us prioritize these jobs following different rules of job sequencing.

As a first step, it is necessary to compute the following:

- Total completion time
- Average completion time
- Average number of jobs in the system
- Average job lateness

*Solution 1: (MINPRT/SOT)*

Job Order/ Sequence	Process Time	Flow Time/ Cumulative Process Time	Due Date	Job Lateness
W	5	5	12	0
X	6	11	18	0
Y	7	18	21	3
Z	10	28	14	14
<b>Total</b>	<b>28</b>	<b>62</b>		<b>17</b>

**Total Completion Time:** Twenty-eight days, i.e., the total of process time to complete all jobs

**Average Completion Time:** The average time or days that jobs remain in the systems. This is calculated by dividing the total Flow Time with the number of jobs in the system, in this case,  $62 \div 4 = 15.5$

**Average Number of Jobs in the System:** This is calculated by dividing Total Flow Time by Total Process Time, here that means  $62/28 = 2.21$

**Average Job Lateness:** Obtained by dividing Total Job Lateness by Total Number of Jobs in the System, therefore, in this System,  $17/4 = 4.25$

*Solution 2: FCFS*

If we follow the FCFS method for this problem, we will get the same result as above. Thus, the total completion time, average completion time, average number of jobs in the system and average job lateness under the FCFS rules are the same as those obtained under the MINPRT/SOT rule.

*Solution 3: LPT*

Job Order/ Sequence	Process Flow Time	Time/ Cumulative Process Time	Due Date	Job Lateness
Z	10	10	14	0
Y	7	17	21	0
X	6	23	18	5
W	5	28	12	16
<b>Total</b>	<b>28</b>	<b>78</b>		<b>21</b>

**Total Completion Time:** 28 days

**Average Completion Time:**  $78/4$ , i.e. 19.5

**Average No. of Jobs in the System:**  $78/28$ , i.e. 2.78

**Average Job Lateness:**  $21/4 = 5.25$

*Solution 4: DD*

Job Order/ Sequence	Process Time	Flow Time/ Process Time Cumulative	Due Date	Job Lateness
W	5	5	12	0
Z	10	15	14	1
X	6	21	18	3
Y	7	28	21	7
<b>Total</b>	<b>28</b>	<b>69</b>		<b>11</b>

**Total Completion Time:** 28 days

**Average Completion Time:**  $69/4$ , i.e., 17.5 days

**Average Number of Jobs in the System:**  $69/28$ , i.e., 2.46 Nos.

**Average Job Lateness:**  $11/4$ , i.e., 2.75 days

**Solution 5: (DS/RO)**

According to this method, it is necessary to indicate separately the number of operations against each job. There may be a number of operations for any given job.

To take an example, for manufacturing a ball point pen, the operations involved would be as under:

- Put Polymer dust in the dice to get the body
- Fix the metal part like holding pins, etc., on the cover
- Insert refill into body
- Emboss brand name/logo
- Pack the final product

The rules discussed earlier are static, but this rule is dynamic. In our hypothetical problem, let us assume the number of operations involved in each job is as below:

Job W: 2

Job X: 3

Job Y: 2

Job Z: 4

As stated earlier, if the number of operations is not specified, it is assumed to be one. Given the above number of operations, we shall now solve the problem. First, the job sequences have to be ranked in order of the minimum slack time or DS/RO ratio and the jobs rearranged according to the computed values.

Job Sequence	Processing Time	Desired Delivery Date	DS/RO Ratio	Rank
W	5	12	3.5	2
X	6	18	4	3
Y	7	21	7	4
Z	10	14	1	1

Now as per the rank (given in the last column), we have to arrange the job sequence and compute the earlier details, i.e., the average completion time, average job lateness, etc.

Job Sequence	Processing Time	Flow Time/ Cumulative Processing Time	Due Date	Job Lateness
Z	10	10	14	0
W	5	15	12	3
X	6	21	18	3
Y	7	28	21	7
Total	28	74		13

Total Completion Time: 28 days

Average Completion Time:  $74/4 = 18.5$  days

Average Number of Jobs in the System:  $74/28 = 2.64$

Average Job Lateness:  $13/4 = 3.25$  days

We can now compare different job sequences using the different prioritization rules and decide which is better under the given situation:

Sequencing/ Priority Rules	Total Time	Average Completion Time	Average No. of Jobs in the System	Average Job Lateness
MINPRT	28	15.5	2.21	4.25
FCFS	28	15.5	2.21	4.25
LPT	28	19.5	2.78	5.25
DD	28	17.25	2.46	2.75
DS/RO	28	18.5	2.64	4.25

One criterion is not sufficient to compare the different rules; therefore, we have to consider all the resultant figures under the various sequencing rules. However, two criteria, i.e., average job lateness and the average number of jobs in the system are given the most importance. Therefore, the DD method is considered more efficient than the other methods, in the above example.

**Johnson's Rule**

S.M. Johnson developed this sequencing process which helps to minimize idle time of different work centres by optimum job allocation. This is applied where a number of jobs have to be processed through different work centres. The basic principles of these rules are as follows:

**Step 1:** Listing respective time requirement of each job at each work station.

**Step 2:** We need to consider the job with the shortest processing time. If this job is meant for the first workstation, it can be scheduled first. However, if the job with shortest processing time is meant for workstation 2, it has to be scheduled last. If two or more jobs of work centres 1 or 2 have the same processing time, an arbitrary decision needs to be taken.

**Step 3:** Once the first and last jobs have been identified under the Step 2 and have been allocated, we do not consider these jobs further.

**Step 4:** Positions are assigned to all other jobs following the same logic explained in step 2 and 3.

We shall explain this rule through an example where there are two work centres.

**Example:**

X and Co. is engaged in casting and machining of different group of jobs. Casting operation is carried out at Work Centre 1 and machining at Work Centre 2. These two operations complete the total job. Scheduling of jobs needs to be done allocating them between the two work centres, so as to minimize idle time as

much as possible. The following information provides data on the time required at each work centre for all the job groups:

Job Title	Casting (Work Centre-1 in days)	Machining (Work Centre-2 in days)
A	6	7
B	8	8
C	16	2
D	7	3

**Solution:**

**Step 1:** Listing of all the jobs with their respective time requirements at different work centres, as done above.

**Steps 2, 3 and 4:** We see from the table that job 'C' at Work Centre 2 has the lowest processing time. Therefore, according to Johnson's rule, it will be assigned last. Similarly, job 'D' has the second lowest processing time; hence, it will be assigned second last. Job 'A' at Work Centre 1 has the third shortest processing time and is, therefore, scheduled first. The sequencing position will, therefore, look like this:

A   ?   D   C

Since there is only one job left, i.e., 'B', this will be assigned next to 'A'. The final scheduling would therefore be:

Position of Sequencing	1	2	3	4
Jobs assigned	A	B	D	C

The sequential times for two work centres would be as below:

Work Centre 1	6	8	7	16
Work Centre 2	7	8	3	2

Using a Gantt chart we can illustrate the Johnson's algorithm as under:

Work Centre-1	A		B		D		C	
	6		8		7		16	
Work Centre-2	Idle Hours	A	Idle Hours	B	D	Idle Hours	C	Idle Hours
	6	7	1	8	3	4	2	14

### Gantt or Bar Charts

This method, which was introduced in 1917, is the oldest and the most extensively used method for production planning, scheduling and control. The Gantt chart shows the relationship between different activities over a time span. Time frame,

expressed either in terms of hours, days, weeks or months is shown on the horizontal or X-axis and activities are plotted against the Y-axis. The time frame or time scale would depend on the nature of operations and activities, which may be determined by the previous experience or an approximation based on which activities may be scheduled and monitored. The charts may be in the form of any of the following:

- Scheduling or progress charts, which show the sequence of job progress
- Load charts which show the work assigned to a work group or allocated to machines
- Record charts which track the actual time spent and delays, if any

Gantt charts need to be updated at regular intervals, for instance, when a work is delayed at the start or when work continues beyond its time schedule or if the progress of work is not as per the actual plan. If unforeseen eventualities occur, corrective actions may have to be taken, and this will also need corresponding changes in Gantt charts.

A Gantt chart is a matrix which lists on the vertical axis all the tasks to be performed. Each row contains a single task identification which usually consists of a number and name. The horizontal axis is headed by columns indicating estimated task duration, skill level needed to perform the task and the name of the person assigned to the task, followed by one column for each period in the project's duration. Each period may be expressed in hours, days, weeks, months and other time units. In some cases it may be necessary to label the period columns as period 1, period 2 and so on.

The graphical portion of the Gantt chart consists of a horizontal bar for each task connecting the period start and period ending columns. A set of markers is usually used to indicate the estimated and the actual start and end. Each bar on a separate line and the name of each person assigned to the task is on a separate line. In many cases, when this type of project plan is used, a blank row is left between tasks. When the project is under way, this row is used to indicate progress, indicated by a second bar which starts in the period column when the task is actually started and continues until the task is actually completed. Comparison between the estimated start and end and the actual start and end should indicate project status on a task-by-task basis.

Variants of this method include a lower chart which shows personnel allocations on a person-by-person basis. For this section, the vertical axis contains the number of people assigned to the project, and the columns indicating task duration are left blank, as is the column indicating persons assigned. The graphics consist of the same bar notation as in the upper chart indicates that the person is working on a task. The value of this lower chart is evident when it shows the slack time for the project personnel, i.e., times when they are not actually working on any project.

The advantages and disadvantages of Gantt charts are as below:

#### Advantages

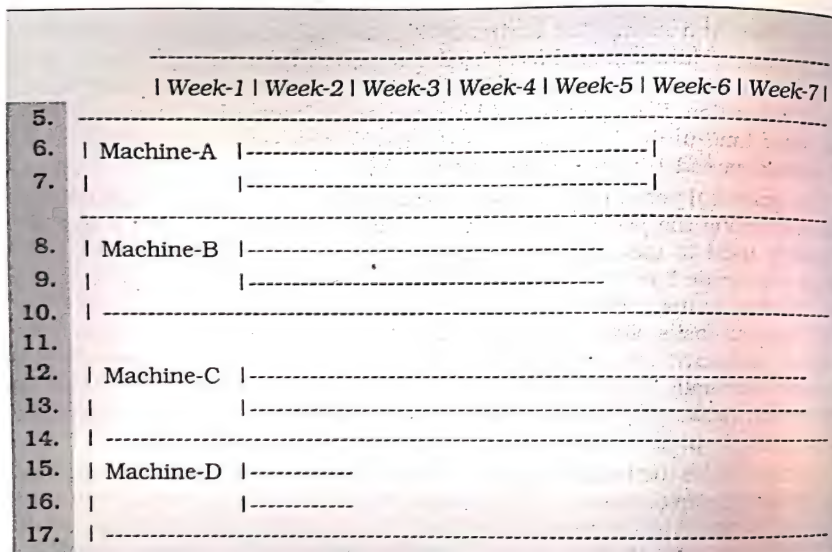
- This is a simple and very inexpensive method and can be developed even by supervisory staff with some amount of training

2. These charts clearly show the decided time and work schedules for every job
3. Monitoring and control are easier and can be done within a minimum time frame and at the lowest cost
4. These charts can be changed and updated quickly at a lower cost
5. There is no need to develop the customized Gantt chart boards as the standard chart boards are available in the market

### Disadvantages

In spite of the above-mentioned advantages, there are certain disadvantages.

1. They do not show job interrelationships and interdependence
2. Cost implications cannot be shown
3. With these charts, it is not possible to depict other alternatives for project completion
4. The shape and form of Gantt charts can differ according to the nature of the requirement. Shown below is a very simple Gantt load chart:



The above chart shows that Machine-A has been loaded till the fifth for a given job, and Machine-B has been loaded till the first half of the fourth week and so on.

### Dispatching

Another common technique for job sequencing is dispatching or the dispatch list. In this method, the jobs are ranked and the relative priorities are given, which are based either on due date or critical ratio. Due date has been explained above; critical ratio is computed by dividing time remaining by work remaining, as shown below:

$$\text{Critical Ratio (CR)} = \frac{\text{Time Remaining (TR)}}{\text{Work Remaining (WR)}}$$

A CR equals to 1 means that the job is on schedule, a CR of less than 1 indicates that the job is behind the schedule, and a CR that is more than 1 is indicative of slack time.

The production planning department prepares a dispatch list based on the relative priority, and the work responsibility is assigned to the respective shop floor in-charge. Traditionally, such persons are called either dispatcher or planner. It is their responsibility to visit shop floors to collect data on work progress according to the dispatch list and also give the prepared dispatch list to the respective shop floor in-charge's charges. However, due to the increasing reliance on computerized Management Information System (MIS) they are now becoming redundant.

### Line of Balance Chart (LOB)

This chart, which is slightly more complex than the Gantt chart integrates information on delivery dates of the final output with the information on the completion time of sub-assemblies of the final product. It helps to monitor the progress of sub-assemblies or components (both make and buy items) according to the delivery date. Capacity requirement planning is now replacing the LOB technique.

### Work Breakdown Structure (WBS)

In order to identify the individual tasks in a project, it is useful to create a *work breakdown structure*. The method goes as—Get the team together and brainstorm all of the tasks in the project, in no particular order. Write them down on sticky notes and put them on a whiteboard. Once, everyone has thought of as many tasks as possible, they can arrange the sticky notes into groups under the major areas of activity.

The development of a project plan is predicated on having a clear and detailed understanding of both the tasks involved, the estimated length of time each task will take, the interdependence between those tasks and the sequence in which those tasks have to be performed. Additionally, resource availability must be determined in order to assign each task or group of tasks to the appropriate worker.

One method used to develop the list of tasks is to create what is known as a *work breakdown structure*.

WBS number	Task Description
1.0	Project initiation
1.1	Draft project plan
2.0	Analysis phase
2.1	Plan user interviews
2.2	Schedule users interviews
3.0	Examination and test

(Continued)

4.0	Design
5.0	Test
6.0	Implementation
7.0	Post implementation review

Tasks at each successively finer level of detail are numbered to reflect the task from which they were derived. Thus, the first level of tasks would be numbered 1.0, 2.0, 3.0 and so forth. Each of their subtasks would have a two-part number: the first part reflecting the parent task and the second part, the subtask number itself, such as 1.1, 1.2 or 1.3. As each of these, in turn, is decomposed or broken down into its component tasks, each component receives a number comprised of its parent number plus a unique number of its own.

### Milestone Charts

Milestones mark significant events in the life of a project, usually, critical activities which must be achieved on time to avoid delay in the project. Milestones should be truly significant and be reasonable in terms of deadlines (avoid using intermediate stages).

Examples include:

- Installation of equipment
- Completion of phases
- File conversion
- Cut-over to the new system

### NETWORK ANALYSIS

Network analysis is a managerial technique which helps to identify the interconnecting links in a single system. It is a useful tool in systems design which assists in recognizing or identifying the relationships that exist among the sub-systems.

It is done by describing each segment or linkage of the system in terms of other components or activities of the system. Thus, it makes explicit the total system and the interrelationships among the parts. A network is illustrated by a flow chart or diagram. The flow of materials and/or information is measured as volume, specifications or time.

### Benefits

1. It helps to reappraise existing systems and identify duplication and over-lapping that may detract from the effectiveness of the system design.
2. It helps management to evaluate the sub-systems and their interconnecting networks continuously, consistent with the over-all objectives of the system.
3. It allows an evaluation of the impact of various sub-system changes on other sub-systems and/or the total system. A change in type of output or

a change in scheduling in a particular sub-system can affect operations in other areas. This effect can be determined in units of time, money, facilities or other resources.

4. It encourages introspection of an existing system or provides the framework for visualizing the make-up of a proposed system.

### Defects

1. It provides no guarantee for effective system design, as variations in performance could always occur.
2. There always exists the danger of assuming relationships among segments which do not exist, ignoring important relationships which should be considered or weighing existing relationships improperly.
3. It requires constant follow-up as the relationship among the segments may change with time.

### Different Forms of Network Analysis

There are different forms of network analysis, which may be simple or complex, may be very generalized or may be exclusively designed for specific types of projects. PERT/PEP and CPM are the most widely used techniques used in network analysis.

#### Critical Path Method (CPM)

This technique is used for planning, scheduling, estimating and controlling engineering and construction. This method was used by Du Pont in 1959 to schedule plant maintenance shutdowns during changeovers. The lessons learned through this application, later on, was used to plan building construction and other large construction projects.

The key tool in this technique of planning, scheduling and controlling complex construction jobs is a diagram using arrows to represent specific jobs. Such line diagrams clarify the relationships of every task to every other task, which cannot be explained using bar chart. Critical jobs are those jobs which relate to one another (from start to finish of a project), each depending upon completion of the one before it. Total project time, therefore, is the summation of the time to be taken by critical job.

A simplest form of CPM diagram illustrates the jobs to be performed to finish a project (in order of sequence), timing and costs. Once all these elements are specified, both the total time and the total cost of the project can be determined by adding the different sub-elements.

The consequence of various managerial decisions can be predicted by simulating their impact.

#### PERT/PEP Technique

The PERT/PEP technique is based on critical-path scheduling. However, there is a fundamental difference between PERT/PEP and critical-path scheduling. The PERT/PEP technique is applicable where there is no established system for doing the task and, therefore, no exact basis for estimating the required time to complete

each task. Critical path scheduling, on the other hand, usually is applied to jobs which are established or have been done before and where it is possible to predict performance accurately. Consequently, more sophisticated mathematical models must be used in the PERT/PEP technique.

PERT may, therefore, be defined as follows:

PERT is a statistical technique diagnostic and prognostic for quantifying knowledge about uncertainties faced in completing intellectual and physical activities essential for timely achievement of programme deadlines. It is a technique for focusing management attention on danger signals that require remedial decisions, and on areas of effort for which trade-offs in time, resources or technical performance, might improve capability to meet major deadlines.

The PERT technique is, therefore, based on the concept that in any programme, there are three variables:

- Time
- Resources (HR, facilities, funds)
- Performance specifications

Any one of these may vary within certain limits established for such programme, while holding the other two constant. To take an example, holding time and performance constant, the requirements for resources may be determined.

It is, therefore, clear that both PERT and CPM have similarities in terms of concepts and methodology. We use these techniques in project scheduling problems. However, we use PERT in analysing project scheduling, where completion time is not certain and CPM, where activity durations are known with certainty. In essence, therefore, PERT is probabilistic in nature and more appropriately used in R&D projects, whereas, CPM is a deterministic technique and thus finds application more appropriately in the construction projects.

#### PERT/CPM Networks

A project is a set of activities or jobs (tasks or operations) that are performed in a certain sequence determined logically or technologically. Initially, therefore, it is necessary to determine all specific activities that comprise the project and their interdependent relationships. We can illustrate this with the following example:

Let us assume that a new CNC machine has been procured from abroad, and now it requires installation. Due to this, the activity starts with the procurement of manpower (both from internally and from the firm, from which the machine has been procured), doing grouting and foundation work, doing electrical work, installing the machine, training of the operators and finally, the trial run. Various activities required to be performed then can be distributed, time-wise as below:

#### List of Activities with Precedence Relationships for Installing CNC Machine

Activity Code	Job Description	Job Duration (in days)	Immediate Predecessor(s)
A	Procurement of manpower	2	-
B	Grouting of Foundation	5	A

(Continued)

Electrical Work			
C	Installing the Machine	1	A
D	Train the Operators	1	B
E	Trial Run	6	C
F		1	D, E

The immediate predecessors for a particular activity indicate that those activities are required to be completed before the starting of this job. Once the activities comprising a project and their interrelationships are identified, we can graphically portray by a network or arrow diagram. We can depict the network as Figure 18.1.

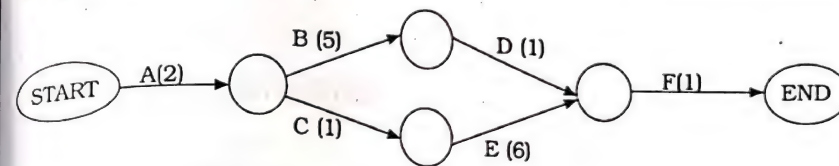


Figure 18.1: PERT CPM Network

How was the diagram drawn?

Notice we have only a single start and end event in the diagram. Time requirement in the diagram flows from left to right and so also the numbering sequence. Each event has been given a unique number; hence, activities have unique label, i.e., head and tail event numbers.

#### Rules of Network Construction

- Each defined activity is represented by a single arrow. Thus a single activity cannot be represented twice in the network.
- Before undertaking a particular activity, all activities, preceding it, should be completed first.
- Events are identified by numbers, and hence, duplication of event numbers must be avoided.
- All networks should have one initial and one terminal node.
- There may be a situation where more than one activity needs to be simultaneously completed. We call this a situation of merge event. Similarly, where more than one activity needs to be simultaneously initiated, we call this a burst event.
- Parallel activities, without having intervening relationships are prohibited.
- It may be necessary to incorporate dummy activity when two or more activities have identical predecessor and successor activities.

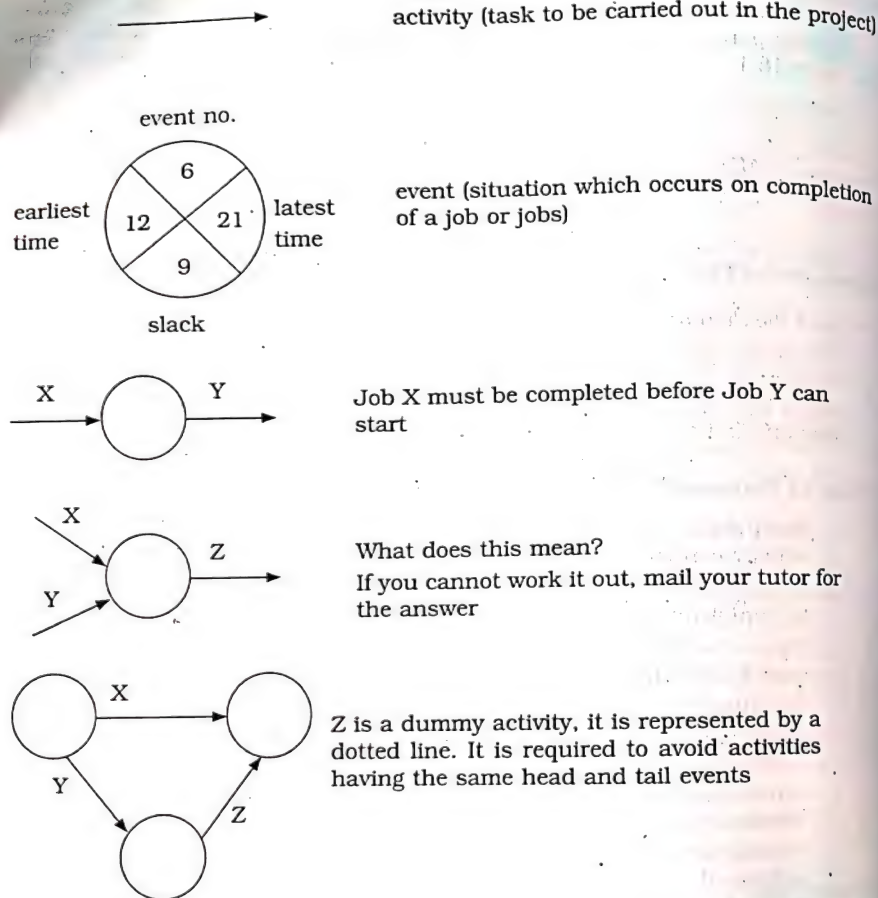
#### Rules Regarding Dummy Activities

In a network, we are required to use dummy activities where two or more parallel activities have the same head or tail events, or else, network construction would

remain incomplete. Dummy activities do not require time or resources and it is indicated by dotted lines.

### Network Diagram Symbols

While drawing PERT/PEP network diagrams, we make use of certain symbols. Some of the common symbols used in the network diagram are indicated in the following:



### Different Time Estimates of PERT

We have so far discussed the methodology of scheduling time for different activities, critical path and the project length, assuming that the activity times are known and constant. However, activity times may not be known, and also they may not

be constant. This is because for PERT there is every possibility to complete a job before the expected time or there may be some unplanned delay. Thus, instead of having a single estimate, there may be three estimates for an activity as under:

#### Optimistic Time (a)

This is the shortest time a particular activity can take to complete and is, therefore, an ideal estimate.

#### Most Likely Time (m)

This is the modal time, which is expected to be taken to complete a job and is based on the past record.

#### Pessimistic Time (b)

This is the longest time and it occurs with a probability of less than 1 per cent. This, therefore, is the worst time estimate, for any eventualities.

With these three time estimates, a single expected time to complete a project is determined with the following weighted average formula:

$$t = \frac{a + 4m + b}{6}$$

Where,  $t$  = expected time of the activity

$a$  = optimistic time

$m$  = most likely, or modal time

$b$  = pessimistic time

The standard deviation, of the completion time of an activity is calculated as follows:

$$\sigma = \sqrt{\frac{b-a}{6}}$$

$$\text{Variance} = \sigma^2 = \frac{(b-a)^2}{6}$$

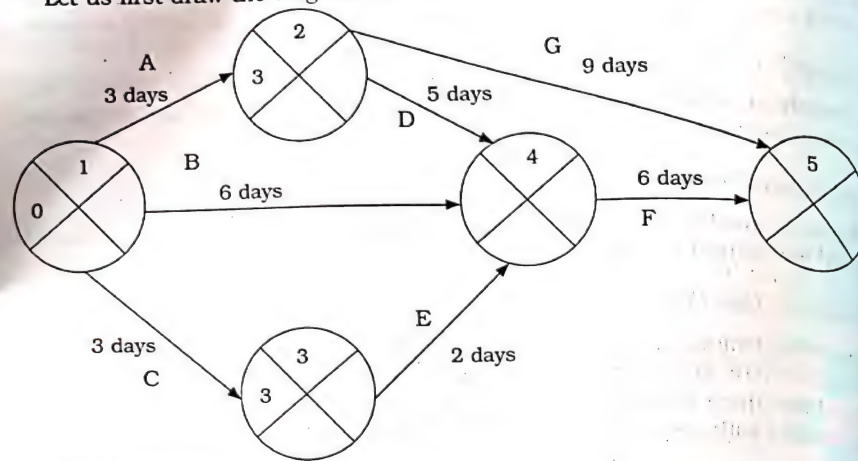
### Critical Path Calculation

Based on the critical path calculation guidelines given before, let us now solve the problem as under:

Task	Dependent on	Duration
A	-	3
B	-	6
C	-	3
D	A	5
E	C	2
F	B, D, E	6
G	A	9

**Calculation of the Earliest Time:**

Let us first draw the diagram as under:



Let us now calculate the earliest time both for the Events 4 and 5.

**Solution to Calculation of Earliest Start Time for Event 4:**

Activity	Preceding ET	Duration	Calculated ET
2 → 4	3	5	8
1 → 4	0	6	6
3 → 4	3	2	5

So the earliest start time for Event 4 is day 8 (by this time all the preceding activities will have been completed).

**Solution to Calculation of Earliest Start Time for Event 5:**

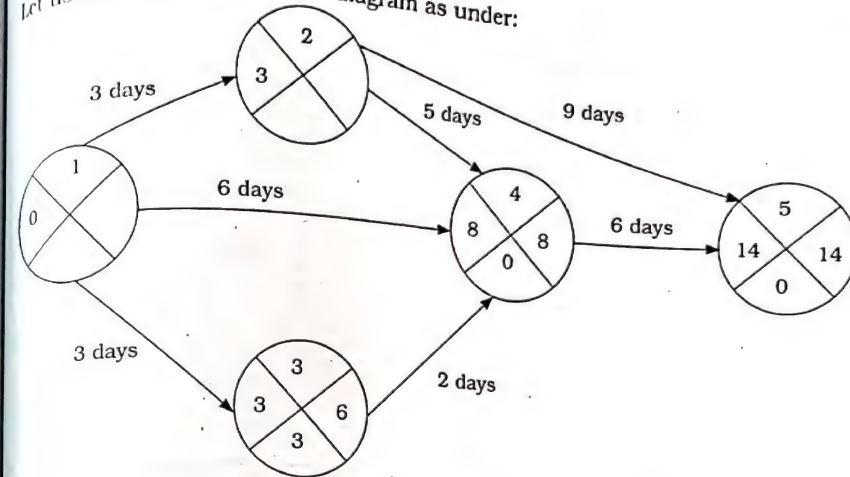
This solution builds on the previous one—the earliest start time for Event 4 was day 8; therefore,

Activity	Preceding ET	Duration	Calculated ET
2 → 5	3	9	12
4 → 5	8	6	14

So the earliest start time for Event 5 is day 14 (by this time, all the preceding activities would be completed).

**Calculation of the Latest Time:**

Let us once again redraw the diagram as under:



Based on the above, let us now calculate the latest time of events 2 and 1.

**Solution to Calculation of the Latest Start Time for Event 2:**

Activity	Preceding ET	- Duration	= Calculated ET
2 → 4	8	5	3
2 → 5	14	9	5

So the latest start time for Event 2 is day 3 (by this time, the minimum amount of remaining time is left to complete the subsequent tasks).

**Solution to Calculation of Latest Start Time for Event 1:**

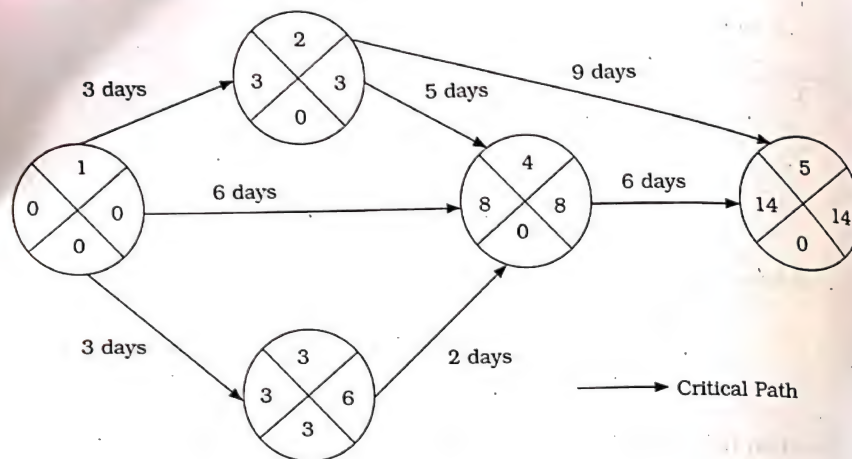
This solution builds on the previous one—the latest start time for Event 2 was day 3; therefore,

Activity	Preceding ET	- Duration	= Calculated ET
1 → 2	3	3	0
1 → 3	6	6	0
1 → 4	8	3	5

So the latest start time for Event 1 is day 0 (by this time, the minimum amount of remaining time is left to complete the subsequent tasks).

Note that the latest time of Event 1 must be zero (otherwise, it would mean that an error has occurred).

### Diagram of the Critical Path



### Important Characteristics of a Critical Path

1. Every network should have a critical path.
2. A single network may have more than one critical path.
3. A critical path is one of the connecting links (in a network, we may have more than one connecting links) between the initial and terminal activity.
4. Number of activities in a critical path may be less than the activities in non-critical path.
5. A critical path may have dummy activity.
6. A critical path determines project duration time.
7. Activities on critical path are by nature critical activities.
8. If the project duration time need to be shortened then activities on critical path need to be shortened.

### How to Find Out Critical Path in a Network

1. Draw the network enumerating all the paths.
2. List the activities on each of the path.
3. Sum up the activities along each path.
4. Identify the longest duration along each path. The longest duration is obviously the critical path in the network.

Let us now try this problem. In table below we have given optimistic (a), most likely (m) and pessimistic (p) time for a project completion. Compute the expected time of project completion and draw the network to show the critical path.

Activity	Time			Tie = $a+4m+b/6$	$ol = b-a/6$ (standard deviation time of an activity)	$ol = \text{variance of}$ completion time of an activity
	a	m	b			
A 1-2	2	4	6	4		
B 2-3	3	5	13	6	4/6	4/9
C 2-4	2	6	10	6	10/6	25/9
D 3-6	13	18	23	18	8/6	16/9
E 3-5	8	16	24	16	10/6	25/9
F 4-6	6	7	14	8	16/6	64/9
G 5-7	2	6	10	6	8/6	16/9
H 6-7	2	4	6	4	4/6	4/9
I 7-8	4	5	6	5	2/6	1/9

After you draw the network, check for yourself whether you get the critical path as 1-2-3-5-7-8 or A-B-E-G-I. Summing up the time, along the critical path, your expected time for project completion or project length would be thirty-seven days.

Variance of the expected project length

$$= 4/9 + 25/9 + 64/9 + 16/9 + 1/9 = 110/9 \text{ days}$$

Standard deviation of expected project length

$$= \sqrt{110/9} = 3.496 \text{ days}$$

### CRASHING OF PROJECT

Basic assumptions of CPM analysis are that activities and functions of a project can be crashed to reduce time requirement for project completion. However, crashing increases direct costs, obviously for increasing the man-hours, which consequently increases wage payment and wastages, like normal scrap-arising, etc. Whether project crashing is beneficial or not, is weighed by finding out the difference between crash cost and normal cost. If crashing seems to be the better alternative, then critical path is redrawn by correspondingly reducing the time requirement. It is important to note that crashing will not eliminate the requirement of any activity, but it reduces the time requirement of any activity or activities.

### DEFINITION OF A PROJECT

The Project Management Institute, USA defined project as a 'one-shot, time-limited, goal directed, major undertaking, requiring the commitment of varied skills and resources.' It is also 'a combination of human and non-human resources pooled together in a temporary organization to achieve a specific purpose'. A project can be considered to be any series of activities and tasks that:

- Have a specific objective to be completed with certain specification
- Have defined start and end dates

- Have funding limits (if applicable)
- Consume resources (i.e., money, people, equipment)

UNIDO defines a project as 'a proposal for an investment to create and/or develop certain facilities in order to increase the production of goods and/or services in a community during a certain period of time'. W.C. Baum and D. Tolbert (1985) defined project as 'a discrete package of investments, policy measures and institutional and other actions designed to achieve a specific development objective (or set of objectives) within a designated period'. James P. Lewis, has defined a project as 'one time job that has defined starting and ending dates, a clearly specified objective or scope of work to be performed, a predefined budget and usually a temporary organization that is dismantled once the project is completed'.

### MAIN CHARACTERISTICS OF A PROJECT

The principle characteristics of a project, therefore:

1. It is an undertaking which has defined objectives, often including time, financial and technical performance goals.
2. It has a defined starting and ending points.
3. It uses a wide variety of resources and skills and involves cost and time.
4. It involves the coordination across organizational boundaries of groups and organizational unit.

It is an instrument of change and is unique.

Various works that are interrelated and are being performed to serve a common purpose can be grouped together and termed as project.

In a project there is a concept of wholeness despite diversities of work.

S. Choudhury (1989) has explained following features of a project. These are:

1. Set of objectives
2. It has a life span
3. Single entity
4. Team work
5. Life cycle—growth, maturity and decay
6. Uniqueness
7. Change—changes while project is on-going and may even change the entire character of the project
8. Successive principles—details get finalized
9. Made to order—customized
10. Unity in diversity—a complex set of thousand varieties
11. High level of sub-contracting
12. Risk and uncertainty

### PROJECT LIFE CYCLE

By and large, all projects have to pass through the following five phases:

1. **Conception Phase:** In this phase, project idea germinates.

2. **Definition Phase:** In this phase, a document is prepared based on a generated idea covering all aspects like—

- (a) Raw materials
- (b) Plan size/capacity
- (c) Location and site
- (d) Technology/process selection
- (e) Project layout
- (f) Plant and Machinery
- (g) Electrical and instrumentation work
- (h) Civil engineering works
- (i) Utilities—fuel, power and water
- (j) Manpower and organizational pattern
- (k) Financial patterns
- (l) Implementation schedule

3. **Planning and Organization Phase:** This is also known as project execution plan and this incorporates:

- (a) Project infrastructure and enabling phase
- (b) System design and basic engineering package
- (c) Organization and manpower
- (d) Schedules and budgets
- (e) Licensing and governmental clearances
- (f) Finance
- (g) Systems and procedure
- (h) Identification of project manager
- (i) Design basis, general conditions for purchase and contracts
- (j) Site preparation and investigation
- (k) Construction resources and materials
- (l) Work packaging.

4. **Implementation Phase:** Eighty to eighty-five per cent of the project work is done in this phase only.

5. **Project Clean-up Phase:** Drawings, documents, files, operation and maintenance manuals are catalogued and handed over to the customer. Customer has to be satisfied with guaranteed test runs.

### PROJECT MANAGEMENT

Modern project management approach was developed in the early 1960s. First application of modern project management approach was found in the US Space Programme. Tracing history, we find that the project management has its roots to

19th century. More scientific approach to the project management was subsequently felt important to reap the benefits of organized work around specific projects, coordination and communication of the project management related work across the departments or divisions of the organization, etc.

Without trying for general definition of project management, let us first consider what the elements of project management are. Basic elements of project management are:

- Project management is a discontinuous process with definite beginning and end.
- Project management practices require usage of various tools to monitor and track the project. Some of the widely used project management tools like, Gantt chart and PERT have already been discussed in this chapter.
- Resource allocation to projects may not be fixed; with the progress of work, it may require ad hoc resource allocation.
- Risk and probability of failure in project management are considerably less, since it adopts more flexibility in managing the work. Such flexibility ensures lean management, which optimizes the resources. Lean management optimizes resources, eliminating the wastages and adding value to the products.
- Project management considers three most important factors like; time, cost and scope.

With the above backdrop, we can define project management as under:

Project management is a process in managing a discontinuous work or task within a budget and time constraint, achieving customers' satisfaction.

### SUMMARY

Production scheduling and sequencing is an important area of production planning job. Marketing department of any organization may book the orders, competing against others, but its ultimate production and delivery largely depends on the production or operations department. Sequencing or scheduling of production is done in a way, so that overall interests of every stakeholder (like, customers, suppliers, shareholders or the owners, etc.) are safeguarded. This chapter discusses about various sequencing tools and its applications, to help students to understand their usage on organizations. Apart from the sequencing rules, both for the finite and infinite job loading, we have also discussed about Gantt chart, PERT/CPM, and project management practices.

### Key Words

**Lean Management:** Lean manufacturing or lean production systems originated from Toyota that has yet not become widely acclaimed practice to achieve excellence in a competitive world. In a nutshell, lean practices enable an organization to achieve world class performance, world class practices (in methods and processes) and create a culture of relentless continuous improvement (environment).

**Index Method:** This method is applied to finite job loading cases. It is called finite because job loading is done according to the capacity of the machine. Under this method, the lowest time or cost required by a particular job-machine combination is taken as the base, and the indices for the others are prepared based on the base variation.

**dynamic Slack/Remaining Operation (DS/RO) or Minimum Slack per Operation Method (MINSOP):** In DS/RO, we first calculate dynamic slack (DS), which is the difference between due time and processing time and then divide this DS by the remaining operation (RO). Unless specified, RO will be assumed as one. The final scheduling of the job is done as per the ranking of DS/RO. Jobs with the lowest value are attended to first; similar ranking is given in the order of the next lowest and so on.

**Johnson's Rule:** S.M. Johnson developed this sequencing process which helps to minimize the idle time of different work centres by an optimum job allocation. This is applied where a number of jobs have to be processed through different work centres.

**Milestone Charts:** Milestones mark significant events in the life of a project, usually critical activities which must be achieved on time to avoid delay in the project. Milestones should be truly significant and be reasonable in terms of deadlines. Use of intermediate stages should be avoided.

**Work Breakdown Structure (WBS):** In order to identify the individual tasks in a project, it is useful to create a work breakdown structure. Get the team together and brainstorm all of the tasks in the project, in no particular order. Write them down on sticky notes and put them on a whiteboard. Once everyone has thought of as many tasks as possible, they can arrange the sticky notes into groups under the major areas of activity.

### REVIEW QUESTIONS

1. Explain job loading and the steps involved. Does it differ from the index method? Illustrate your answer with some examples.
2. What are the different rules of job sequencing? In your opinion, which rule is the best and why do you consider this the best?
3. When should the Johnson's Rule be applied?
4. Explain the advantages and disadvantages of Gantt charts? Are dispatching and LOB better alternatives than Gantt charts?
5. Explain the rules of network construction. Under what circumstances, can we think of using dummy in a network?
6. Explain the concept of critical path. Why is critical path drawn? What norms should we follow to draw a critical path?
7. Define the term project. Explain the important tools used to manage a project.
8. Short Notes:
  - (a) Project Crashing
  - (b) Project Life Cycle
  - (c) Latest Start Time vis-à-vis Earliest Start Time
  - (d) Critical Ratio
  - (e) Job Lateness
  - (f) Due Date

## REFERENCES

1. Baum, W.C., and D. Tolbert. 1985. *Investing in Development*. Washington DC, US: The World Bank
2. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books.
3. Choudhury, S. 1989. *Project Management*. New Delhi: Tata McGraw Hill
4. Cohen, M.A. 1997. *Manufacturing Automation*. Chicago: Irwin.
5. Konz, Stephen. 1983. *Work Design: Industrial Ergonomics*, 2nd edition. New York: John Wiley & Sons.
6. Chase, Richard B., Nicholas J. Aquilano, and F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
7. Schmenner, R.W. 1995. *Service Operations Management*. Englewood Cliffs, N.J.: Prentice Hall.

## 19

## Work Study

## LEARNING OBJECTIVES

*After reading this chapter, the student would be able to:*

- comprehend the layout concept
- understand the whole concept of Work Study
- know the definitions Work Measurement and Time Study
- learn the meaning of Ergonomics
- appreciate the concept of Motion Economy
- get familiar with the concept of Human Engineering
- understand Value Analysis

## INTRODUCTION

**L**iterally, the term 'work study' implies the study of human work. British Standards 3138:1969 defined work study as:

'A management service based on those techniques, particularly Method Study and Work Measurement, which are used in the examination of human work in all its contexts, and which lead to the systematic investigation of all the resources and factors which affect the efficiency and economy of the situation being reviewed, in order to effect improvement.'

Therefore, it is a generic term for two interdependent techniques, i.e., Method Study and Work Measurement. The British Standard defines Method Study as '... the systematic recording and critical examination of the factors and resources involved in existing and proposed ways of doing work, as means of developing and applying easier and more effective methods and reducing costs.' Method Study, hence, is concerned with the way in which the work is done. The British Standards defines Work Measurement as '... the application of techniques designed to establish the time for a qualified worker to carry out a specified job at a defined level of performance.'

The analysis of this definition of Work Study given by the British Standards Institute enables us to define it as a procedure for understanding and determining the truth about the activities

of the people, plant and machineries. It also helps us to identify the factors that affect efficiency and achieve economy through optimum utilization. Most productivity improvement techniques involve major capital expenditure in plant or equipment, whereas Work Study, being a management technique, ensures greater productivity by using existing resources. The human element is emphasized in the Work Study, and the importance is given to operation rather than to the technical process. This, therefore, assists the management in following three major ways, which are, in fact, its primary objectives:

1. Effective use of plant and equipment
2. Effective use of human effort
3. Evaluation of human work

### HUMAN CONTEXT OF WORK STUDY—TRADE UNIONS' RESPONSE

If Work Study techniques are not applied properly, it is likely that the resistance will be encountered at all levels. It is, therefore, important to understand human reactions to design the programme investigation and implementation accordingly. Most unions are aware that Work Study provides benefits to the workers by eliminating drudgery, frustration and an unhealthy working environment. It also gives an opportunity to the workers to increase their earnings (by achieving increased rate of output). This strengthens the health of the organization at the micro level and the nation, as a whole, at the macro level. However, to satisfy the unions following three points need to be considered:

1. Consult workers before the introducing any scheme. This is likely to affect their interest and morale one way or the other
2. Define a policy for those workers who become redundant for the implementation of the recommendations of the Work Study Team
3. Procedure to deal with the changes in the method of work and for the measurement of work to be laid down and communicated to the workers

International Labour Organization (ILO) emphasized the importance of such sharing of information with the workers in a resolution concerning consultation and cooperation between employers and workers at the level of the undertaking in the 35th Session at Geneva in the year 1952.

### METHOD STUDY

As a productivity improvement step, Method Study helps to produce the same output using fewer resources or to produce more with proportionately less inputs. It reduces, if not eliminates waste. Method Study ensures creativity, innovativeness, optimal decision-making power, good organization practices and better communication. The following issues are the essential elements when carrying out a Method Study:

1. Economic considerations
2. Technical considerations
3. Human reactions

### Role of Method Study

To summarize the above discussions, we can safely say that role of Method Study is:

1. To appraise the purpose and objectives of the organization
2. To assess the tasks of the organization
3. To evaluate the communication and control structure of the organization
4. To optimize the use of resources of the organization
5. To improve procedures, methods and processes of the organization
6. To ensure individual and group effectiveness and, as well as, work satisfaction in the organization

### The Importance and Objectives of Method Study

The primary objective of Method Study is to find better ways of doing things, so as to improve efficiency by eliminating unnecessary work, avoidable delays and other forms of waste. Method Study achieves this by systematic recording, analysis and critical examination of methods and movements involved in the performance of existing or proposed ways of doing work. To clearly state the importance or objectives of Method Study, let us review the contributions that flow from its above role:

1. Reorientation of corporate objectives and mission
2. Review of plans and the programmes
3. Evaluation of tasks, targets and available resources
4. Balancing the structure of the organization
5. Introduction of a good communication system in the organization
6. Better design of plans and equipment
7. Simplification of processes and methods
8. Standardization of products and procedures
9. Improvement of workflow
10. Planning and control of work
11. Managing resources, inventory control and replacement of plants and machineries
12. Quality and cost control
13. Improving the layout of the shop floor
14. Better working environment and working conditions
15. Optimum utilization of resources
16. Higher standards of safety, security and health
17. Performance satisfaction

### Basic Procedure, Steps, Process or Mechanism of Method Study

The Method Study technique is flexible enough to accommodate different given situations. A simple framework for its application in any given circumstance may be designed as given in the following page:

- Select the work to be studied
- Record all the relevant facts of the present (or proposed method)
- Examine facts critically and in sequence
- Develop the most practical, economic and effective method, with due regard to all contingent circumstances
- Install that method as a standard practice
- Maintain that standard practice with regular routine checks

Though we have indicated five basic steps for an actual study, it is not necessary to follow the same sequence or pattern. The selection of the subject of study may be preceded by the study of possibility of data collection. Similarly, preliminary critical examination (pilot study) may be needed in order to identify the problem area. There may be need for more detailed data gathering during a pilot study. It may also be revealed during the preliminary critical examination that the real problem is something other than the one selected. Therefore, sticking to a rigid procedure of analysis may often hamper getting a productive solution.

There should be no element of secrecy during Method Study. Discussions, exchanges of views and efforts at a mutual understanding are the very basis of Method Study. There are also several undefined stages in this study. The final plan has to be discussed with all concerned before implementation. In the same way, prior to the installation of the new system, all the concerned persons are required to be made familiarized to the new machine through reorientation programmes. Once installed, the system has to be maintained to ensure that it becomes an accepted standard.

The steps of Method Study, therefore, can be listed as follows:

1. Initial data collection
2. Preliminary/pilot survey and assessment
3. Identification of problem areas
4. Collection and assembly of data concerning factors related to the subject
5. Determining their interconnection
6. Finalizing the subjects for study
7. Defining the problems/subjects for study
8. Assessment of their impact/reaction
9. Evolving alternatives
10. Deciding optimal solutions
11. Testing the solutions
12. Preparation of the report
13. Presentation of recommendations
14. Decision on implementation
15. Preparation for implementation
16. Installation of the newly evolved system
17. Maintenance of the newly installed system
18. Evaluation of improvements achieved

## Detail Procedures of Method Study

The detailed procedures/steps involved in any Method Study investigation may be taken as:

### Selection of the Job

The first step, once the Method Study idea is conceived, is the orientation and determination of objectives. The problem must be defined. Some common problems the Method Study investigator faces and is usually required to solve are:

- (a) Bottlenecks that disrupt smooth flow of materials or processes
- (b) Products that need to be produced economically by the application of cost-reducing techniques
- (c) Economic utilization of space, including land and buildings
- (d) Economic utilization of labour, material and plant
- (e) Elimination of idle time or non-value adding time caused by problems of flow, queues and congestion

While selecting the subjects for study, firstly, it is essential to remember that the ultimate objective of the Method Study is to improve achievement by raising the level of productivity and increasing satisfaction at work. Secondly, the term 'select' should not be taken in its narrow sense, i.e., to choose from among others. It must include a preliminary survey, which enables the investigator to decide on the continuity of the study. The same holds true for the selection of the job; it must also include the selection of the appropriate techniques to achieve the end result.

### Record the Facts

Adequate facts about the existing system must be collected before discarding the method or procedure. This is to ensure an objective record of the way the job is carried out is maintained. To eliminate the chance of bias, this record is based on direct observation by the concerned investigator. It is not compiled from second-hand accounts, the manager's version on how he thinks the job is done or an operator's description of how the job is done.

### Critically Examine the Facts

This is an important stage of Method Study; the information that is being collected is scrutinized, and each part of the job is critically examined to determine whether any part may be:

- (a) Eliminated altogether
- (b) Combined with another part of the job
- (c) Changed in sequence
- (d) Simplified to reduce the content of work involved

For effective examination of the facts, the following questions are generally asked:

- (a) What is done and why?
- (b) Who does it and why that person?
- (c) Where is it done and why there?

- (d) When is it done and why then?
- (e) How is it done and why this way?

Rearranging, simplifying, combining, eliminating or modifying the facts or records obtains a base for an improved method.

### Develop the New Method

The alternatives selected are used to reshape and develop the new method, layout or procedure. These may require test runs to determine their feasibility. It is preferable that tests of this nature are carried out at a place away from the work site, if possible. It is good to involve the departmental officers to ease the problems of acceptance for the new method in the department. The end result must be an improved method. It must be acceptable to the departmental staff and workers. It must meet all their practical requirements and technical specifications.

### Install the Method

Prior to installing the new method, decisions must be taken on:

- (a) Ordering of new plants or materials (if any)
- (b) Phasing in changes in the production process
- (c) Deciding the extent of redeployment
- (d) Introducing new documentation procedures
- (e) Setting new quality standards and test procedures
- (f) A detailed timetable for effecting these changes

The end product of the installation stage is that the new method is in operation at the work site; there is a complete control of line management; and finally, all members of the department are fully conversant with the method.

### Maintaining the Method

When a method has been installed, it tends to change slowly as a result of minor alterations made by the operators or supervisors. To detect any alterations, a reference standard (job instruction sheet) is needed against which the job can be compared. Likewise, a corresponding document for an incentive scheme, which also contains details of the standard time for each job, called a job specification, is prepared. With this data, changes in method can be detected. If changes are considered to be useful, the instruction sheet can be amended to incorporate them. If they are thought undesirable, they can be removed through line management.

## WORK MEASUREMENT

ILO defines Work Measurement as '... the application of techniques designed to establish the work content of a specified task by determining the time required for carrying it out at a defined standard of performance by a qualified worker.' This is conventionally known as *Time Study* and is primarily carried out to determine the standard time to perform a specific task. This standard is used for planning and scheduling work, cost estimating and labour cost control. It may serve as the base for a wage incentive plan. Its most popular application is in deciding a wage incentive plan.

## Techniques of Work Measurement

There are different techniques of Work Measurement, the principal techniques of them being:

1. Time study
2. Ratio-delay study (statistical sampling technique)
3. Synthesis from standard data
4. Predetermined motion time standard
5. Analytic estimating

Out of all these, only the *Time Study technique* is widely used, others being complicated in nature. Here too, we will only discuss details of the *Time Study technique* only, while simply defining the others.

### Time Study

ILO defined Time Study as 'a technique for determining as accurately as possible from a limited number of observations, the time necessary to carry out a given activity at a defined standard of performance.' Equipments required to carry out a Time Study are—Stopwatch, Study Board, Pencils, Slide-rule, etc. Stopwatches are of different types, e.g.:

1. A stopwatch that records one minute per revolution by intervals of 1/5 of a second, with a small hand recording thirty minutes
2. One that records one minute per revolution, calibrated in 1/100th of a minute, with a small hand recording thirty minutes
3. A decimal-hour stopwatch recording 1/100ths of an hour per revolution graduated in 1/1000ths of an hour and a small hand that records up to one hour in 100 divisions

### Steps in Time Study

Following steps are necessary for carrying out a Time Study for measurement of work:

1. To collect and complete all available information about the job. This should include surrounding conditions and the attitude of the operators, which are likely to affect the work
2. To record the details of the method and also to break down different operations into elements
3. To record the time taken by operators to complete the task (element-wise), measuring preferably with a stopwatch
4. To assess the working speed of operators, comparing the same with a predetermined standard speed
5. To convert the observed time to the normal time
6. To decide the rate of allowances which may be given over and above the normal time of the operation
7. To determine the allowed time for operation

## Other Techniques of Work Measurement

As conducting a Time Study for each job is a time-consuming task, statistical techniques, like Ratio-Delay Study, are often done. Ratio delay is a sampling technique. Instead of going for the complete job production study, under ratio-delay techniques, a statistical sampling of a large number of readings is taken at random intervals. Like in all other sampling techniques, under this method also there bound to be some errors. However, since the cost of such studies is much less, many organizations that have the expertise may prefer this method. Another advantage in this method is that since rating is not being done, recording the time directly using a stopwatch encounters no resistance from the workers.

Under this method, synthesis from the standard data is done, as synthesized times are time standards that are built up or synthesized from element times previously obtained from direct time study. The process of synthesis helps to approximate the time requirement from the available standard data. Organizations that have an independent Work Study Department usually build up synthetic tables covering the commoner elements. Some units also use such time records of other organizations as standard data. For obvious non-commonality of technology, skill, process and working environments, this type of synthesis may not always be correct.

Based on the elementary movement, predetermined *motion time standards* have been developed for different job elements. For time measurement, work factor and basic motion times are usually recorded in any predetermined time standard. These time standards are used by Work Study analysts as the basis for comparing the observed time of the present workers. This enables them to quickly decide the efficiency or otherwise of the workers and to give decisions accordingly.

Analytical estimating, a compromise between straight rate fixing and time study, is normally used in plant maintenance and repair work. Since, maintenance and repair jobs call for creativity and innovativeness and also require adequate planning, it is difficult to enforce straight rate fixing, the skill element being altogether ignored.

Analytical estimating is difficult in nature and not always foolproof for inexperienced work-study men.

## CONCEPT AND DEFINITION OF ERGONOMICS

Derived from two Greek words, '*ergon*' meaning work and '*enomos*' meaning laws, Ergonomics is the study of the effects of work system on workers. The objective of this science is to fit the work to the men doing the job, with a view to increase their efficiency, comfort and satisfaction. ILO defines Ergonomics as:

'The application of human biological sciences, in conjunction with engineering with sciences, to the worker and his working environment, so as to obtain maximum satisfaction for the work which, at the same time, enhances productivity.'

A contextual analysis of the ILO definition provides a more meaningful basis of understanding Ergonomics. An Ergonomist tries to integrate the work system (which would include the tasks, working equipment, working conditions and working space) with the capabilities and requirements of work. In this process, he tries to ensure job satisfaction for the workers, which increases their productivity.

Ergonomics can be applied to all schemes of human enterprise, like offices, factories, shops, ships, air and even in space. Some areas where Ergonomics have been successfully applied are:

- Design of equipment, power and hand tools
- Design of displays and warning systems
- Design of furniture, seats, rests and steps for operators
- Design of tools, jigs and fixtures
- Plant layout
- Improvement in working conditions and environments
- Computation of relaxation allowances for workers
- Selection, training and placement of personnel
- Motivation of workers

To understand the subject better, let us group the areas of Ergonomic investigation of a work system as follows:

**Human Characteristics:** Health, physique, anthropometrical data, personal background, education, training, experience, age, sex, intelligence, aptitude, reaction time, interest, personality characteristics, temperament, attitude to work and motivation.

**Work:** Physical loads, perceptual loads, mental loads, displays and warning systems, controls, compatibility of inputs and outputs.

**Working Conditions:** Workplace layout, postures, motion and movements, fatigue, monotony and relaxation allowances, comfort, safety and health, working hours and shifting working conditions.

**Environments:** Illumination, ventilation, temperature and humidity, colour dynamics, fumes, dust, odour and smoke, landscape, scenery and garden, cleanliness and sanitation.

There are many alternative terms to name this discipline like, Human Engineering, Human Factors in Engineering, Engineering Psychology, Applied Experimental Psychology, Applied and Human Engineering Research, Man-Machine System Analysis, etc. This subject was developed during World War II with the synchronized efforts of physiologists, psychologists and design engineers. Its earliest application is traced to Frederick Winslow Taylor (1856-1915). Taylor's experiments were aimed at developing optimum design of equipment for specific types of work and also to train the workers to suit each kind of task. Frank Bunker Gilbreth (1869-1924) and his wife Lillian elaborated the *Principles of Motion Economy* and introduced rest pauses and spacing out in the work environment to reduce fatigue and eliminate stresses. Since then, with the advance of Experimental Physiology, Psychology and Method Study, the subject delved deeper into the human make-up for better and scientific understanding of the effects of working conditions and environment on the human body and mind.

## Impact of Ergonomics on Work Study

Work Study aims at the scientific analysis of a work system to increase productivity and satisfaction at work. It is dependent on Ergonomics for research data on the many facets of human reaction to a given work situation. This input information

makes the task of a Work Study practitioner more scientific and result-oriented. Such input information/data are mostly related to the following areas:

- Limits of sustained physical endurance, normal speeds of movement and optimum method of handling of controls
- Receptivity to sensory inputs and the time required for perception of deviations
- Time required for evaluation and decision making and reaction time for motion output
- Anthropometric data to guide design and layout of equipment, workplace and furniture
- Effects of different environmental conditions on the human being in order to generate improvements
- Effects of working conditions so as to raise the standards of comfort, safety and health
- Qualitative and quantitative analysis of factors contributing to industrial fatigue for computation of 'relaxation allowances'

### Ergonomics's Relation with Management

From the very planning and design stage of a work system, the discipline of Ergonomics is of use to the management. To organize, direct and control human effort towards a specific end, management needs to have an appreciation of the human factors involved in a work system.

The results of Ergonomic research in the field of perceptual and mental loading have a special impact on the work situation, challenging managerial performance in an organization. The aim is to eliminate all perceptual and mental loading that could arise from the examination and evaluation of reports on the normal activities of the organization, highlighting only the deviations from the standard state. This allows application of management time and talent to really important problems. To put it simply, Ergonomics helps in increasing the productivity of managerial brainpower. This change by itself, without any change in the methods on the shop floor, will lead to a spectacular increase in the overall productivity of the organizations.

### Working Areas

The working area of an operator can be categorized into three groups: normal, immediate and maximum working areas. The normal working area is one that can be reached by the operator using any movement up to, and inclusive of, class 3 movements. It is the area that is bound by two arcs made by the fingers using the elbow as the pivot.

The immediate working area is the surface immediately in front of the operator where the two arcs of the normal working area overlap. The maximum working area is one that can be reached by the operator using any movement up to, and inclusive of class 4 movements and is the area bound by two arcs made by the fingers with the shoulders as the pivot.

The space between the normal and the maximum working area is accessible through a class 4 movement. Anything beyond the maximum working area

may be reached only through a class 5 movement, including body bending or stretching.

The immediate working area is the most suitable for bimanual operations. If the various equipments, materials and tools are replaced within the normal working area, they can be reached without using the upper arm and shoulder muscles. It is not desirable to place anything outside the maximum working area.

While considering working areas, the field of vision should also be taken into account. The normal cone of vision without the head movement is restricted. Covering the whole perimeter of the normal working area would impose undue strain on the eye and sometimes involves excessive head movements. Therefore, due care must be taken to place all the materials well within his cone of vision. During inspection as much of the work as possible must take place directly in front of the operator.

Classes of movements can be grouped in the following five categories, based on the pivots around which the body members move:

#### Classes of Movements

Class	Pivot	Body Member Movement
1	Knuckle (Finger Joint)	Finger(s)
2	Wrist	Hands and fingers
3	Elbow	Forearm, hands and fingers
4	Shoulder	Upper arm, forearm, hands and fingers
5	Trunk (body apart from limbs)	Torso, upper arm, forearm, hands and fingers

A similar classification is available for movements corresponding to the leg. For economy of motion, the movement should be of the lowest classification possible that is compatible with the normal capacity of the body member affected.

### MOTION ECONOMY

The process of minimizing the physical and perceptual loads imposed on people engaged in any type of work is known as Motion Economy. It could be in the office, the shop floor, the kitchen or at the driving wheel. This science leads to better design of equipment, jigs and fixtures, hand tools, furniture and labour saving devices. It also facilitates better layout of offices, warehouses, plants and operating areas like the office desk, work bench, aircraft, cockpit and crew compartments of armoured fighting vehicles, etc. The application of the principles of Motion Economy eliminates or minimizes the wasteful and fatiguing movements and increases the productivity of workers. It insists on minimizing the movements with respect to:

- Number of movements
- Length of movements
- Classification of movements
- Number of parts of body used
- Necessity for control

- Muscular force
- Complexity movements
- Distances between eye fixation
- Time required for eye fixation

Different specialists propounded the following principles, for achieving motion economy:

- Principle of Minimum Movement
- Principle of Natural Movement
- Principle of Simultaneous Movement
- Principle of Rhythmic Movement
- Principle of Habitual Movement
- Principle of Continuous Movement

Simultaneous movements reduce fatigue and increase the rate of output. Greater fatigue is caused when only one hand works, while the other one is idle. Simultaneous movements include movements of the feet, while both the hands are operating, e.g., driving a car. The application of this principle, enabling both hands work at similar tasks simultaneously, leads to a better design of jigs, fixtures and duplication of tools.

It is advisable that the principle of symmetrical movements be applied in conjunction with simultaneous movements. Proper balance is achieved only when the movement of one hand is the mirror image of the movement of the other. Symmetry in movements eliminates mishandling and promotes ease and speed. When movements of the hands are asymmetrical, operators tend to throw in additional non-productive movements in order to achieve balance.

Rhythm is the regular repetition of a pattern of movement. It often includes the emphasis of a specific part of a cycle. Rhythm plays an important role in increasing the speed, eliminating the tendency of fumbling and reducing fatigue. The examples of rhythmic movements are rowing a boat, hammering done by a blacksmith and drawing water from a well using a seesaw lift.

The pattern of movements should be designed so as to facilitate habit formation. When a cycle of activities becomes a habit, movements are executed almost as a reflex action. Habitual movements eliminate hesitations and increase the speed of performance. Rhythm helps to expedite any habit formation. Tools, materials, displays and controls must always be located in the same position. The pattern must be standardized for similar types of panels, work places and equipment. Continuous movements that are smooth and curved are superior to jerky straight-line movements, which involve sudden changes of direction and loss of momentum. Materials, tools and jigs must be so positioned to eliminate undue changes of direction and to incorporate smooth, curved and continuous movements.

These principles should not be treated as inflexible rules, but guidelines. For optimization, a proper evaluation of all the principles in their totality is required. This is because frequently, individual principles could be in conflict with one another. Conditions differ from job to job. At times, it may be necessary to compromise on the principle of minimum movements in order to equitably distribute the physical load over the various muscles. At other times, it may be necessary to give due weightage to the principle of continuous movement. Hence, it is essential that the principles be applied with flexibility.

## HUMAN ENGINEERING

Method Study seeks to determine the most efficient combination of the man, the machine and the working environment. It is necessary to determine which functions are better performed by man and which functions are better performed by machine. Both man and machine surpass each other in different ways. Economy again influences the man-machine combination. The term 'human engineering' is more appropriately used to solve these man-machine problems in design, operation and maintenance of plants and machineries. In fact, it is not appropriate to treat this science as an independent discipline as it comes broadly under the purview of ergonomics. To understand the context and meaning of Human Engineering, it is better to define it in line with Ernest J. McCormick. McCormick defined it as the mechanism for 'the adaptation of human tasks and working environment to the sensory, perceptual, mental, physical, and other attributes of people. This adaptation for human use applies to such functions as the design of equipment, instruments, man-machine systems, and consumer products, and to the development of optimum work methods and work environment.'

### Human Engineering and Machine Design

A designer of a machine should know how the human body functions, its dimensions, physical limitations and so also the conditions under which a person performs perfectly. For performing a task, a person normally does the following three things:

- Receives the information (through different sense organs)
- Makes decisions (acting on perceived information)
- Takes action (which results from decision)

Thus, the basic control cycle for a human being is sense, decide and act. The power to reason inductively, exercise judgment, develop concepts and create methods is unique to human beings. While performing quick repetitive routine tasks, the power to perform rapid computations, apply great force, simultaneous performance of many different functions, etc., are characteristic features of machines.

A designer of the machine should, therefore, consider all the above details before designing better machines for productive use. Most computer numerically controlled (CNC) machining centres developed by large industrial organizations in India are not performing well. This is because they have been designed without considering the human factor. A point to note is that sophisticated machining centres, whenever introduced, have become instrumental in giving rise to problems of industrial relations, since these adversely affect workers' pay packages.

Since, a badly designed machine may be responsible for poor performance of workers, the application of ergonomic/human engineering techniques is necessary to design the machine. Modern machines are ergonomically designed to prevent stress and fatigue of workers to facilitate ease at work, while at the same time gain in terms of increased rate of production. The application of human engineering/ergonomic techniques has been found useful even in designing consumer products, kitchen gadgets, furniture, etc. Recently, Blow Plast Ltd. under technical collaboration with Klobor of Germany, ergonomically designed office chairs.

## VALUE ANALYSIS

In 1947, drawing lessons from World War II, Harry Erlicher of General Electric Company observed that substitution of materials (as manufacturers were then compelled to go for substitution to encounter shortages of original materials) often led to cost reduction and better functionality. This prompted further research in alternative materials and processes. In fact, L.D. Miles, another top executive of the company, was directed by him to go into the details of this substitution, which was later called Value Analysis. By 1949, this approach was used in a more institutionalized form at General Electric Company and gradually in the US Department of Defence. By 1970, the concept of Value Analysis gradually received international attention.

Value Analysis is the organized creative technique to analyse functions of a product, service or a system to achieve the required functions at the lowest cost ensuring its performance reliability and maintainability. This is also known as Value Engineering or Value Management.

Value is literally the worth of article/product/services. Value is determined in terms of cost and function. The value of a product can be improved by:

1. Improving function (keeping cost constant)
2. Reducing cost (keeping function constant)
3. Both by improving function as well as by reducing cost

There are different types of value for an industrial product. These may be classified as:

- **Use Value:** The properties and qualities which are useful and which enable the accomplishment of the given work. This type of value may be either for primary use, secondary use or for auxiliary use
- **Esteem Value:** Aesthetic features or properties which attract a customer to own it
- **Cost Value:** The cost required to produce the item
- **Exchange Value:** The properties which enable the owner to exchange it for anything else, if he so desires in future

However, for all practical purposes, industrial situations are primarily concerned with *Use Value* and *Esteem Value* only.

In the backdrop of the above discussion, Value Analysis can be defined as a method of search, a systematic procedure resulting in the orderly utilization of alternative materials and processes. It focuses on engineering, manufacturing and purchasing with attention on one objective that of obtaining equivalent or even better performance at a lower cost.

### Steps in Value Analysis

Following are the steps to be followed for Value Analysis:

1. Collection of full facts and information about the product
2. Get the details of the cost break-up
3. Determine the function
4. Think creatively
5. Compare and evaluate the alternatives

- To succeed in each step, it is necessary to take following line of action:
1. Eliminate the redundant parts
  2. Initiate action of cheaper substitutes without impairing the use value
  3. Standardize the parts
  4. Develop alternative methods
  5. Redesign, if necessary

### Advantages

We can get the following advantages from Value Analysis:

1. Lowering of cost
2. Better quality of product
3. Increased efficiency
4. High level of morale and team spirit
5. Increased customer satisfaction
6. Optimum resource utilization
7. Improved methods of production
8. Increased job satisfaction and motivation in workers due to the use of creative ability

Value Analysis has now been replaced by the term Value Engineering in corporate circles, and most of organizations, follow these practices by forming a Value Engineering team of workers (a small group activity like Quality Circles, etc.). This provides an opportunity to workers to derive creative satisfaction and also to fulfil their intrinsic needs. At the same time, organizations also get active services from the workers.

### Problems of Time Study

Time Study is a work measurement technique that is widely used in industry to decide standard time and then to compare the time taken by the workmen. Though it basically helps in pricing a job, it is also used for other purposes like deciding on training requirements, payment of incentives and rewards, etc. Try the following problem to understand its computational details.

Set the standard time for manufacturing Ball Point Pens based on the following activity details. You have observed the ongoing job for 100 hours and have seen that within this period 1000 Ball Point Pens have been manufactured. Assume that during work, workmen get personal time allowance at 10 per cent. Compute Standard Time for manufacturing a single Ball Point Pen.

Activity	Rate (Per cent)	No. of Times Jobs Observed
A	120	200
B	90	300
C	80	500
D	70	100
	Idle Time	200
Total Observed Time =		1300

**Solution**

To solve the problem, at the outset, it is necessary to compute Average Cycle Time, dividing observed period by the number of ball point pens produced, i.e., 100 Hours/1000 Ball Point Pens = 1/10 of an hour, i.e., six minutes.

Thus, six minutes on an average is taken for manufacturing a ball point pen.

Now, we have to compute activity-wise distribution of time using this formula:

Average Cycle Time  $\times$  (Observed Time/Total Time)  $\times$  Rating

Average Cycle Time has already been computed, which is six minutes

Observed Time is the activity-specific time, already shown in the problem

Total time is the total observed time. Rating is the perceived rate of efficiency of the observer given in the problem

- (a) Time taken for Activity 'A'  
 $6 \times (200/1300) \times (120/100) = 1.1$
- (b) Time Taken for Activity 'B'  
 $6 \times (300/1300) \times (90/100) = 1.2$
- (c) Time Taken for Activity 'C'  
 $6 \times (500/1300) \times (80/100) = 1.8$
- (d) Time Taken for Activity 'D'  
 $6 \times (100/1300) \times (70/100) = 0.3$

Total Normal Time = 4.4

Now, we have to compute Standard Time using this formula:

(Total Activity-wise Time or Normal Time / (1 - Personal Fraction Time))

**SUMMARY**

Work Study is defined as a procedure for understanding and determining the truth about the activities of the people, plant and machineries. It also helps us to identify the factors that affect efficiency and achieving economy through optimum utilization. Most productivity improvement techniques involve major capital expenditure in plant or equipment, whereas, Work Study, being a management technique, ensures greater productivity by using existing resources. The human element is emphasized in Work Study, and the importance is given to operation rather as opposed to the technical process. Like Work Study, Method Study also helps in enhancing productivity. This apart, in this chapter, we have discussed other important tools of production and operations management. The chapter concludes with the discussion on Value Analysis and Engineering.

**Key Words**

**Method Study:** As a productivity improvement step, Method Study helps to produce the same output using fewer resources or produce more with proportionately less inputs. It reduces, if not eliminates waste. Method Study ensures creativity, innovativeness, optimal decision-making power, good organization practices and better communication.

**Motion Economy:** The process of minimizing the physical and perceptual loads imposed on people engaged in any type of work is known as Motion Economy. It could be in the office, the shop floor, the kitchen or at the driving wheel. This science leads to better design of equipment, jigs and fixtures, hand tools, furniture and labour saving devices. It also facilitates better layout of offices, warehouses, plants and operating areas like the office desk, work bench, aircraft, cockpit and crew compartments of armoured fighting vehicles, etc. The application of principles of Motion Economy eliminates or minimizes wasteful and fatiguing movements and increases the productivity of workers.

**Human Engineering:** Method Study seeks to determine the most efficient combination of the man, the machine and the working environment. It is necessary to determine which functions are better performed by man and which functions are better performed by machine. Both man and machine surpass each other in different ways. Economy again influences the man-machine combination. The term 'Human Engineering' is more appropriately used to solve these man-machine problems in design, operation and maintenance of plants and machineries. In fact, it is not appropriate to treat this science as an independent discipline as it comes broadly under the purview of ergonomics.

**Value Engineering:** It is the organized creative technique to analyse functions of a product, service or a system to achieve the required functions at the lowest cost ensuring its performance reliability and maintainability. This is also known as Value Analysis or Value Management.

**REVIEW QUESTIONS**

1. Define Work Study. What are its important objectives? Why do trade unions react to Work Study Programmes? In what way can you combat such reactions?
2. What are the important roles of Method Study? Identify the important contributions of Method Study and discuss at least five such contributions in detail.
3. Elaborately discuss the steps involved in a Method Study Programme.
4. Define Work Measurement. What are its different techniques? Discuss at least three techniques elaborately.
5. What are the steps involved in a Time Study Programme? How does it help Work Measurement Programme in an industrial unit?
6. What is Ergonomics? How does it help to increase productivity? Discuss with examples.
7. What are the basic principles of Motion Economy? Discuss these principles in relation to a work area, with which you are familiar.
8. Explain how Human Engineering techniques influence machine design. Select an advertisement of a furniture item and discuss its ergonomic features.
9. What are the steps involved in Value Analysis? What course of action would you suggest for a successful Value Analysis Study? Elaborate your answer.

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books.
2. Cohen, M.A. 1997. *Manufacturing Automation*. Chicago: Irwin.
3. Konz, Stephen. 1983. *Work Design: Industrial Ergonomics*, 2nd edition. New York: John Wiley & Sons.
4. Chase, Richard B., Nicholas, J. Aquilano, and F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
5. Schmenner, R.W. 1995. *Service Operations Management*. Englewood Cliffs, M.J. Prentice Hall.

20

# Maintenance Management

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- understand the definition and the concept of maintenance
- know the different types of maintenance
- be familiar with maintenance policy, maintenance-related problems and its solutions
- comprehend the concept of learning curve and reliability
- learn about the spare parts planning and maintenance

## INTRODUCTION

Maintenance can be defined as the operation of a pool of resources, i.e., men, spares and tools, etc., to control the level of availability and condition of the plant. Therefore, it means that the function of maintenance is to repair, replace, adjust or modify, as required, different parts of plant to ensure its smooth operation and performance. This is done using the pool of resources of men, spares and tools. Maintenance ensures flawless functionality of the plant and machineries. It substantially reduces machine downtime, ensuring continuous production. With scientific back-up maintenance support, it also contributes to the profitability of an organization by substantially reducing costs.

In organization, the task of maintenance is assigned to a separate technical team, known as maintenance team or department. People, who work in maintenance department, normally are not assigned any job of the operation department. Their services are required as and when the maintenance problem occurs when required basis, usually when there is a breakdown. Problem of maintenance is time independent, i.e., when it will occur is not known. Hence, planning for the maintenance staff is difficult. It means every organization needs to carry the inventory of maintenance manpower, whether they are required or not. For this reason, many organizations outsource this function to optimize their maintenance costs. However, such outsourcing may not always

be feasible, for the obvious criticality of maintenance jobs and high-cost obligations for machine downtime.

Studies indicate that at least one-third of the maintenance cost is avoidable with proper maintenance planning and control. Poor capacity utilization, decreased rate of output, quality failure, etc., at least can be partially attributed to the problem of maintenance. Problem of maintenance is a global issue and in India the problem is even more acute.

The Total Quality Management (TQM) approach emphasizes on the maintenance management issues also. Even in getting ISO certification and sustaining it, it has now become mandatory for the organizations to put their renewed efforts in restructuring their maintenance function, keeping pace with the recent trends.

### DIFFERENT TYPES OF MAINTENANCE

Maintenance functions can be classified into different types. Organizations select the specific type of maintenance, depending on their plans and programmes and also the specific policies of maintenance.

#### Breakdown Maintenance

It is a traditional form of maintenance, and it requires organizations to make available a separate maintenance team. The services of this maintenance team are called upon time to time whenever there is a machine breakdown. Frequency of such services or the problem of breakdown occurrences depends on the age of the machines and plant workload, defects in the system, etc. To understand the trend, it therefore becomes necessary for every organization to maintain machine breakdown or the failure statistics. By analysing this, it is possible to understand three different kinds of probability distribution as under:

- (a) Normal distribution
- (b) Negative exponential distribution
- (c) Hyper-exponential distribution

These distributions have been outlined in detail later in this chapter with mathematical logic. What is important to understand here is that maintenance problems do not follow any uniform defined distribution pattern. In fact, they vary from case to case. Maintenance work in case of any breakdown being time-independent, it is often difficult for an organization to decide the optimal manpower requirement. It is also often difficult to gauge the requirement of other pools of resources like spares and tools for effectively carrying out maintenance work.

#### Preventive Maintenance

Normal wear and tear of machines can be avoided by adhering to a preventive maintenance programme. Preventive maintenance has been defined as per BS: 3811:1974 as, 'Maintenance carried out at predetermined intervals, or to other prescribed criteria, and intended to reduce the likelihood of an item not meeting an acceptable condition.'

Preventive maintenance activities involve:

- (a) Periodic inspection to avert breakdowns and depreciation of plant
- (b) Upkeep of plant by routine adjustment and repair

This helps to prolong the useful life of a plant by preventing breakdown and damage, thereby minimizing production interruptions.

The overall objective of the maintenance function is to support the operating department by keeping production equipment and facilities in proper running condition at the lowest possible cost. Preventive maintenance alone does not always prove adequate to achieve this. It also requires a huge cost and does not alone facilitate the actual investigation into the reasons for failure.

#### Corrective Maintenance

To compensate for the failings of breakdown and preventive maintenance, the corrective maintenance policy is considered a better alternative. Corrective maintenance involves the study of equipment design and its improvements, like changes in design, substitution of more suitable components or improved materials to eliminate or to reduce the frequency of maintenance problem. Corrective maintenance tools in organizations are:

- (a) Corrections, i.e., improvements in the maintenance pattern
- (b) Redesign, i.e., modifications in the existing design
- (c) Substitution, i.e., replacement of components with more improved versions
- (d) Changes in material specifications

#### Predictive Maintenance

The predictive maintenance approach works on the prediction of likely failures of equipment and making provision accordingly for maintenance activities ahead of probable date of failure. For successful predictive maintenance, it is necessary:

- To monitor condition of equipment
- To analyse failure
- To collect statistical data

#### Total Productive Maintenance (TPM)

This kind of maintenance involves all employees of an organization through participation in small group activities. TPM was first introduced in Nippondenso Co. Ltd of Japan in 1969, after they experienced difficulty in preventive maintenance activities of automated equipment (with conventional maintenance crew). The important features of TPM are:

- Activities to maximize equipment effectiveness
- Autonomous maintenance by operators
- Company-led small group activities

The TPM Programme organizes all employees from the top management to production-line workers in a company-wide maintenance system to support productive facilities. The dual goal of the programme is zero breakdown and zero defect. Its results are tremendous. There is an obvious elimination of breakdowns and defects, there's an improvement in operations, and the costs are reduced. This helps to increase the productivity. In addition to all tangible benefits, it also ensures intangible benefits, which the Japanese list as the five 'S':

- (a) Seiri (Orderliness)
- (b) Seiton (Tidiness)
- (c) Selso (Purity)
- (d) Seiketsu (Cleanliness)
- (e) Shitsuke (Discipline)

### NEED FOR MAINTENANCE POLICY

Every organization needs to adopt a maintenance policy based on the following to ensure an effective maintenance management programme:

- Establish a scheduled planned maintenance, based on predictive analysis or monitoring of equipment's condition
- Avoid unnecessary tampering of equipment
- Liquidate breakdown problems or any equipment that affects production, on priority basis

Some organizations follow a work control system to organize maintenance activity. This involves:

- (a) Planning
- (b) Scheduling
- (c) Materials Coordination
- (d) Maintenance Contacts Coordination

### SPARE PARTS PLANNING AND CONTROL IN MAINTENANCE

Most of the organizations maintain stock of spare parts for maintenance job. As this constitutes a major part of the inventory investment, proper planning and control of spare parts requirement are extremely important. Both for preventive and breakdown maintenance, we need to plan for spare parts. While preventive maintenance is planned and carried out at a periodic interval, the breakdown maintenance problem is time independent. Even systematic preventive maintenance does not give guarantee to eliminate breakdown maintenance. Planning for the spare parts essentially depends on data analysis of failure pattern. Using these data, we decide on the service level or downtime/understocking cost and accordingly, compute the number of spares to be stocked. However, stocking policy depends on the nature of spares.

For *regular spares*, which are required in large numbers, breakdown occurs either as per normal distribution (normal wear-out) or as per Poisson distribution (for system overload). In this case, the service level is computed by following formula:

$$\frac{K_u}{K_u + K_o}$$

where,  $K_u$  = Opportunity cost for understock of one unit

$K_o$  = Opportunity cost for overstock of one unit

This helps us to decide about regular and buffer stock. Usually, these are low-cost items.

We decide to procure *insurance spares*, which are rarely required during the lifespan of equipment because of high reliability, only when the machine's downtime cost calls for better approximation. The formula for computation of expected machine downtime would be:

$$(\text{Probability of failure}) \times (\text{Machine Breakdown costs})$$

These are usually high-cost items.

*Capital spares* are required in less quantity than regular spares. These are also expensive items and procurement decision is taken on the service level. *Rotable spares* are repairable and re-usable. Here, a format named Multi-channel Single Service Queuing Theory to decide about the procurement of spares.

Example:

A company requires to maintain inventory of spares for breakdown maintenance. The failure pattern of this item shows a Poisson distribution trend. The mean breakdown rate is six items per month. Lead time for procuring this item is one month. The company wants to maintain a service level of 90 per cent. Calculate the buffer stock requirement of the spares.

Solution:

This is a problem of regular spares requirement. Hence, we will use the fixed reorder system.

With mean breakdown rate of 6 ( $\lambda$ ), Poisson distribution table shows that the cumulative probability of X at 90 per cent service level is 0.916. This is written as under:

X = 9 Cumulative probability is 0.916

If we assume X = 8, Cumulative probability is 0.847, which, however, falls short of 90 per cent service level.

Thus with stock of nine items (X), during lead time, we satisfy the requirement of maximum demand rate ( $D_{\max}$ ) corresponding to 90 per cent service level. Buffer stock during the lead time, therefore, would be the difference between  $D_{\max}$  and  $\lambda$  (which is  $D_{\text{average}}$ ).

$$X = (D_{\max} - D_{\text{average}})$$

$$X = 9 - 6$$

$$X = 3$$

Therefore, the desired buffer stock would be three items only during the lead time.

Let us now examine a problem on insurance spares. As explained earlier, insurance spares have high reliability and are costly. Such items being critical in nature, its non-availability may cause a huge downtime cost. Often, we need to decide whether we should procure these spares along with the equipment or not. We take such decisions of procurement if;

$$(\text{Probability of failure}) \times (\text{downtime cost}) \geq \text{Purchase Price}$$

Example:

A critical spare of a CNC Machining Centre has a very high reliability of 99 per cent. The equipment is of import origin and its downtime cost in terms of lost

sales (during the lead time of one month) is estimated at Rs 3 crore. The cost of the spares is Rs 15 lakh. The company would like to know whether they should procure the spares along with the machine or not.

**Solution:**

1. Calculate the probability of failure, which in our case is  $(1 - \text{Reliability})$ , i.e.,  $1 - 0.990 = 0.01$ .
2. Compute the expected cost of downtime, which in our case is  $(0.01 \times \text{Rs } 3 \text{ crore}) = \text{Rs } 3 \text{ lakh}$ .

Since, the cost of procurement of spares is Rs 15 lakh, which is much higher than the expected cost of procurement, it is not advisable to procure the spares along with the machines.

Capital spares being in between regular spares and insurance spares and also by nature expensive (though less than insurance spares), for effective maintenance, it is desirable to hold the optimum number keeping in view the service level. We have explained the formula for its computation earlier. Here, we will examine a problem to understand its computation.

**Example:**

A company has identified the probability of requirement of capital spares based on their historical data as under:

Requirement of Spares	Probability
0	0.05
1	0.05
2	0.05
3	0.10
4	0.15
5	0.20
6	0.15

The cost of machine downtime due to the non-availability of spares has been estimated as Rs 450. Each spare costs Rs 150 to the company; the failed spares have a salvage value of Rs 20 each. The company would like to know the number of spares they should stock to maintain the service level.

**Solution:**

- (i) Compute the probability of  $i$ th ( $P_i$ ) for the corresponding 'N' (number of spares required). Corresponding N is determined averaging the spares requirement, which in our case is  $21/7 = 3$  (N). Cumulative probability ( $P_i$ ) for  $N = 3$  is  $0.15$  ( $.05 + .05 + .05$ ). For  $N - 1 = (2)$ , the associated ( $P_i$ ) is  $0.10$  ( $.05 + .05$ ).
- (ii) Compute the associated probability for maintaining the service level. This is found out by using following formula:  

$$C_s - C/C_s - S,$$

where,  $C_s$  = Cost of shortage per spare  
 $C$  = Cost of each spare  
 $S$  = Salvage value of each spare

Therefore, in our case it is

$$(450 - 150)/(450 - 20) = 300/430 = 0.69767$$

- (iii) Now, compare this probability with the associated probability of  $N$  and  $N - 1$  as found out in step (i). As per the formula, if associated probability for the service level ( $0.69767$ ) is less than or equal to  $N - 1$  and  $N$ , we consider the corresponding N value as our optimal stock requirement. Hence, the company should maintain a stock of minimum three spares to maintain the service level.

Rotable spares being repairable and re-usable, we use Multiple Channel Single Service Queuing Theory, assuming defective equipment as 'arrivals' and spares as 'servers'. Service time here is the time taken to repair the spares. Here, we compute the utilization factor first and then assess the cost implication for holding the different number of spares based on the data. The lowest cost for the corresponding spares becomes the basis for selection. Let us examine this problem using one live example.

Indian Airlines have hangers at the airport in Delhi. These hangers are repair shops for Boeing Planes. In one of their hangers, Boeing Planes arrive for repair thrice per week. The engines of these Boeing Planes are repairable and every time when Boeings are sent to hangers for repair, engines are thoroughly checked and overhauled. Indian Airlines has twenty Boeings, and each Boeing has three engines. Each engine costs Rs 1.5 crore. To avoid downtime, engines are replaced from the standby, every time they are grounded for repairs. Their mean rate of repair/reconditioning is four engines per week. The cost of non-availability of engine to the company is Rs 30 lakh per week, and 25 per cent of investment on buying and storing the engines is the cost of capital to the company. Assuming breakdown and service rates follow a Poisson distribution, suggest what should be the optimum holding of spare engines.

**Solution Hints:**

There are twenty Boeings with three engines each; hence, the total number of engines is sixty. Since this is in number, we will use infinite source assumption.

Mean arrival rate ( $\lambda$ ) = 3 per week

Mean servicing rate ( $\mu$ ) = 4 per week

Utilization factor ( $\rho$ ) =  $\lambda/S\mu$

where, S is the number of spares

We'll have to analyse the problem for different values of S (i.e., Spare engines)

Assuming  $S = 2$ , we compute as under:

Utilization factor ( $\rho$ ) =  $\lambda/S\mu = 3/2(4) = 3/8 = 0.375$

Likewise, we have to find out the total cost and decide at which inventory level of spare engines the total cost will be the minimum

(Ans: 3 spare engines).

### Assessment of Maintenance Capacity

It is necessary to compute the manpower requirement depending on the maintenance load. This has been illustrated below:

A company has given you the following information, based on which you have been asked to suggest them what should be the optimum number of workers. A machine breaks down at a mean rate of 0.4 per day. One worker can repair one machine per day, i.e.,  $u = 1$ . The machine's nature is such that repair time gets proportionately reduced with the increase of workers. However, the number of workers cannot be increased beyond three, as logistic support is inadequate. If at any point of time, the company desires to increase manpower beyond three, it is required to develop a second line.

Maintenance workers are paid Rs 300 per day, whereas, the machine's idle cost is Rs 650 per day. Consider the optimum number of workers assuming no other cost is involved.

**Solution:**

Let us now compute the mean of broken machine as under:

$$\frac{\lambda (\text{Lamda})}{\mu (\text{Meu}) - \lambda (\text{Lamda})} = \frac{0.4}{1 - 0.4} = .66$$

Total cost of one repair, assuming one worker is deployed, would then be:

$$\text{Rs } [1(300) + 0.66(650)] = \text{Rs } (300 + 429) = \text{Rs } 729$$

Assuming two workers are deployed, the mean rate of failure would be

$$0.4 / (2 - .4) = 0.25$$

The cost of repair would then be:

$$\text{Rs } [2(300) + 0.25(650)] = \text{Rs } 762.5$$

Assuming three workers are deployed, mean rate of failure would be:

$$0.4 / (3 - 0.4) = .15$$

The cost of repair would then be:

$$\text{Rs } [3(300) + 0.15(650)] = \text{Rs } 997.5$$

From this problem, it can clearly be seen that the company, in reality, gets benefited only when it employs one worker, since the proportionate cost goes up with the increase in number of workers. Hence, under the prevailing circumstances, the company should only use one worker for machine maintenance jobs.

### Learning Curve

Discovered by T.P. Wright in 1936, the Learning Curve was used to analyse the factors affecting the cost of airplanes. Similarly, we can use the Learning Curve to assess the manpower requirement, work scheduling, material requirement planning, etc.

80 per cent Learning Curve means:

- The first unit takes eight labour hours
- Second Unit takes 80 per cent of 8 Hours, i.e., 6.4 hours

Likewise, labour hours would proportionately decrease for the subsequent units.

The usual Learning Curve Model is  $y = ax^b$ , where,

$y$  = average time per unit of  $X$  units

$a$  = time taken for the first unit

$x$  = cumulative number of units

$b$  = learning coefficient

**Example:**

A company manufacturing TV sets has experienced 85 per cent Learning Curve. The company would like to compute the labour hours required to manufacture fiftieth unit when it takes 3000 hours for manufacturing the first set.

**Solution:**

$$Y = 3000 (50)^b$$

$$b \text{ coefficient is } = -0.23446, \text{ i.e., } (\log 0.85 / \log 2) = -0.07058 / 0.30103$$

$$\text{Hence, } Y = 3000 \times 50^{-0.23446}$$

$$\log 3000 - 0.23446 (\log 50) = 3.07878$$

$$\text{Antilog of } 3.07879 \text{ is } 1198.8918 \text{ hours.}$$

Hence, labour hours required for manufacturing the fiftieth unit would be 1199 hours considering Learning Curve rate of 85 per cent.

Certain other maintenance problems like, computation of failure rate and reliabilities, have also been illustrated through this problem for better appreciation of the subject.

**Example:**

Bearings used by Rollers of Sonajuli Tea Co. go out of order frequently. The company maintains data of bearing failure. The last four months' data has been given as under:

Time to Failure	1st month	2nd month	3rd month	4th month
No. of Failures	50	30	20	18

From the above record, we have to compute:

- Average time to failure
- Mean rate of failure
- Reliability of any bearing running well for four months

**Solution:**

Time	No. of failure at the end of the month	No. of bearing remains o.k. until the end of the month	Ratio of failure to surviving
1.	50	118	$50/118 = 0.4237$
2.	30	68 (118 - 50)	$30/68 = 0.4411$
3.	20	38 (68 - 30)	$20/38 = 0.5263$
4.	18	20 (38 - 18)	$18/20 = 0.9$

**Average or Mean Time to Failure (MTTF)**

$$1 \times (50/118) + 2 \times (30/68) + 3 \times (20/38) + 4 \times (18/20) \\ = 0.4237 + 0.8823 + 1.5789 + 3.6 = 6.4849 \text{ months}$$

**Mean Rate of Failure**

$$1/6.4849 = 0.1542 \text{ failure per month}$$

**RELIABILITIES**

This is the probability that a piece of equipment or component will perform its intended function satisfactorily for a prescribed time under the stipulated environmental conditions. Unreliability is the probability of failure. Reliabilities are expressed either as decimals or percentages. The frequency at which malfunctions occur is called the failure rate,  $\lambda$  (lambda), and it is measured by the number of failures for each hour of operation or number of operations. Five failures in 1000 hours of operation would constitute a failure rate of 0.005 per hour. The reciprocal of the failure rate is the mean time between failures (MTBF). The mean time between failures for a failure rate of 0.005 per hour is 200 hours.

**TYPES OF EQUIPMENT FAILURE**

Equipment failures are of three types:

**Early failure**, which occurs during the 'debugging' or 'burn-in' period due to poor assemblies or weak, sub-standard components that fail soon after the start-up of a system. These are gradually eliminated with the decrease in the early failure rate until the overall failure rate reaches a fairly constant level. This fairly constant level is attributable to random failures.

**Random or chance failures** result from complex, uncontrollable and sometimes unknown failures in the useful life of a component or system.

**Wear out failures** begin when the components are past their useful life periods. The malfunction rate increases sharply due to old age and to some random failures.

Failure rates plotted against time for a large number of similar components produce the *bathtub curve*. Although reliability determinations are usually predicted on the useful or random failure period, the use of a *constant failure rate* concept is an over-simplification. This concept has been undergoing modification lately.

According to the concept of constant failure rate, during the useful life of a large number of similar components, approximately the same number of failures will continue to occur in equal periods of time if failed items are replaced continually. The constant failure rate can be described mathematically by an exponential function. When failed items are not replaced, the number of failures during any period will decrease since there are fewer remaining items that can fail. The mathematical expression, indicating the probability or reliability that components in a constant failure rate system will operate successfully to the end of a time period, is the *Exponential Law of Reliability*:

$$R = e^{-\lambda t} \\ = e^{-1/T}$$

(Continued)

where  $R$  is the reliability,  $e = 2.718$ ,  $\lambda$  is the failure rate,  $t$  is the operating time, and  $T$  is the mean time between failures (MTBF).

The ratio,  $t/T$ , between required operating time ( $t$ ) and meantime between failures ( $T$ ) is of an extreme importance according to the Exponential Law of Reliability. When  $t$  equals  $T$ , whether each is one minute or 1000 hours, the reliability is 0.368 (36.8 per cent). To increase reliability, it is necessary that the  $t/T$  ratio be decreased. When the mean time between failures is increased, the failure rate (which is its reciprocal) gets reduced.

The reliability of a complex system depends on the individual reliabilities of its components. If the operation of the system requires that all components operate satisfactorily at the same time, it is said to be a series system. In a series system, overall reliability is equal to the product of the individual reliabilities of the components.

$$\text{System Reliability, } R_s = R \times R \times R \times R \dots\dots\dots$$

This is called the *Product Law of Reliability*. In the event that each component of a six-component system has a reliability of 90 per cent, the overall reliability is

$$R_s = 0.9 = 0.53 \text{ (53 per cent).}$$

Now we can solve our earlier problem as under:

No. of bearings surviving till the end of third month = 38. Therefore, reliability for three months =  $38/118 = 0.322$ , which we can assume as  $\lambda$  (lambda).

Using negative exponential method, we, however, can compute the reliability more accurately.

Reliability  $R = e^{-\lambda t}$ , where

$$\lambda t = 4$$

$$= e^{-(0.322 \times 4)}$$

Value of 'e' is constant, which is 2.7183.

We can solve this problem as under:

$$1/2.7183 \times 1.288 = 1/3.5011 = 0.2856$$

Hence, the reliability that bearings will be alright for four months is 0.2856

Reliability is determined by inherent merits of its design, and hence, the reliability refers to the probability that a particular machine will perform its designed function satisfactorily.

**DESCRIPTIVE METHODS USED IN MAINTENANCE MANAGEMENT**

In maintenance management, descriptive methods like *simulation* and *replacements* are used for prediction of staff requirement. Already, we have mentioned that it is difficult to predict the staff requirement in maintenance department due to the obvious nature of problem of maintenance (it is a time-independent job). Globally, organizations optimize the maintenance cost, wherever it is possible, by outsourcing this function. Even to the requisition of the manpower requirement, simulation technique helps. *Replacement method*, on the other hand, helps us to take decision on staff replacement, group or single replacement of items and so also the machines and equipment replacements.

### Simulation

In maintenance management, we use simulation to examine the behaviour of the system. Using simulation we can manipulate the variables and constants in artificial environment and then implement the same in real-life environment. In this process, we can avoid our intuition and hunches and evaluate the various alternatives to select the best courses of action in predicting maintenance staff requirement in any organization. Thus simulation helps us to estimate our action prior to implementation. There are four phases of simulation as under:

- Definition of the problem and statement of objectives
- Construction of an appropriate model
- Experimentation with the model constructed
- Evaluation of the results of simulation

### Monte Carlo Simulation

Monte Carlo or probabilistic simulation method is a numerical technique used to predict the behaviour of the system. The chance element is a very significant feature of Monte Carlo simulation, and this approach can be used when the given process has a random or chance component.

#### Example:

A power utility services organization maintains the record of the maintenance-staff requirement to predict the requirement for different period. Skills of the maintenance staff are interchangeable. The company, to ensure cost optimization, outsourced their out-bound (at domestic customers' premises) maintenance-staff requirement, and on a daily basis requisitions their requirement from a service provider. Information relating to 200 days' requirement is as under:

	Demand								Total
No. of Staff	5	6	7	8	9	10	11	12	
No. of Days	4	10	16	50	62	38	12	8	200

Develop a simulation model to predict the demand of staff for ten-day period.

#### Solution Steps:

1. Derive the probability distribution of demand for the staff, expressing each of the frequencies in terms of proportions. This is done by dividing each of the values by 200, i.e., the total frequency. The resultant distribution would, therefore, be as follows:

No. of Staff	5	6	7	8	9	10	11	12
No. of Days	.02	.05	.08	.25	.31	.19	.06	.04

2. Determine random numbers using any mechanism of random number generator. There are various ways in which random numbers can be generated. These could be the result of some device like a coin or die, a published table of random numbers, etc. However, the most convenient

method is to make use of the published table of random numbers, published by the Rand Corporation of USA.

3. Work out the assignment so that the interval of random numbers corresponds to the probability distribution. Since the probabilities have been calculated to two decimal places, which add up to 1.00, we need 100 numbers of two digits to represent each point of probability. Thus, we take random numbers 00 through 99 to represent them. Now, as the probability of five staff is equal to .02, we assign two random numbers 00-01 to this demand level; the probability of six staff being equal to .05, in a similar manner, each of the demand levels would be assigned the appropriate intervals as under:

Demand (No. of Staff)	Probability	Cumulative Probability	Random number Interval
5	.02	.02	00-01
6	.05	.07	02-06
7	.08	.15	07-14
8	.25	.40	15-39
9	.31	.71	40-70
10	.19	.90	71-89
11	.06	.96	90-95
12	.04	1.00	96-99

Cumulative probabilities column analyse the assigned numbers to correspond to some probability range for each event.

4. Once the random number intervals are determined, we select a tracking pattern for drawing random numbers from the random number table. We may start with any column and row of the table and read the values in any set manner—horizontally, vertically or diagonally. Using the pattern, we draw the random numbers and match them with the assigned events.

Let us assume for the purpose of this problem, we have decided to take every third value horizontally, starting with the fifth column and fourth row of the table of random numbers. The random numbers, according to this pattern are 61, 74, 24, 03, 59, 16, 84, 92, 52, 07 ..., etc., (for 10-day demand period). We draw as many random numbers as the number of days' demand required to be simulated.

The first number, i.e., 61, lies in the interval 40-70, corresponding to the demand level of nine staff. Thus, the simulated demand for the first day is nine staff members. In a similar manner, we can obtain the demand for each of the day. For the ten-day period, we have the following demand:

Day	1	2	3	4	5	6	7	8	9	10
Number	16	74	24	03	59	16	84	92	52	07
Demand of staff	9	10	8	6	9	8	10	11	9	7

### Advantages and Disadvantages of Simulation

Simulation techniques have both advantages and disadvantages.

The major advantage of this technique is its capacity to lend itself to problems that are cumbersome and even impossible to manage mathematically using analytical methods. Also, the technique allows us to experiment with the system behaviour without taking the risk of experimentation with the real system. It also reduces the time to enable the manager to visualize the long-term effects in a quick manner.

Disadvantages are that the simulation technique is not a derivation of the optimal solutions to a given problem; it merely characterizes the behaviour of the system in question for a given set of inputs. Also, the approach is not precise as it yields only estimates which are subject to sampling error. However, the sampling error can be reduced by increasing the sample size. It may not even prove economical since it requires a lot of efforts to develop a suitable model. It is a tool of solution evaluation and does not generate problem solution. Therefore, it helps us to develop the proposed solution; then test the relative desirability of those solutions.

### Replacement Theory

A replacement is called for whenever new equipment offers more efficient or economical service than the old existing one. To take an example, an old equipment might fail and work no more or it might be worn out. It might need higher expenditure on its maintenance. The problem, in such situations, is to determine the best with respect to replacement of the equipment. The replacement theory provides answer to this question in terms of optimal replacement period.

We consider the question of replacement in the following situations:

- With respect to equipment/assets that deteriorate in performance over a time and may be restored in whole or in part by expanding maintenance costs. Thus, the existing assets might be good technically, yet on economic considerations, it may not be worthwhile continuing with them, and hence, a replacement may be called for. Machinery, equipment, buildings fall in this category.
- With respect to units that perform adequately until a sudden complete failure. The length of their service until failure varies randomly over some predictable range. Car bulbs, tubes, some electronic components, etc., are the items that are considered in this category.
- With respect to the replacement of staff of an organization which diminishes gradually due to death, retirement, retrenchment and other reasons.

### Staff Replacement

The staff of an organization calls for replacement because people leave the organization for several reasons. For planning a suitable recruitment policy, historical data are collected to estimate the likely stay of individuals with the organization through time. Here also, the stay of an individual employee may be a random variable but the characteristics of the group of employees are likely to be fairly stable.

Example:

Year	1	2	3	4	5	6	7	8	9	10	11	12
Percentage expected to leave by end of period	5	18	35	45	62	75	88	90	95	96	99	100

Using the above information, answer the following questions:

- What recruitment level per annum would be necessary to maintain this strength?
- If fifteen of the sales persons are to be promoted to the next higher post, then which length of service in the organization is the primary criterion for promotion and at what average length of service can a new entrant expect to be promoted?

Solution:

With an intake of 100 sales people every year, the distribution of the length of service of the sales force, when equilibrium has been reached shall be as follows:

Year	No. of people continuing
0	100
1	95
2	82
3	65
4	55
5	38
6	25
7	12
8	10
9	5
10	4
11	1
12	0
Total = 492	

Recruitment of 100 sales people every year would thus give a total strength of 492. To maintain the strength of eighty sales people, we need to recruit then:

$$\frac{80 \times 100}{492} = 16.26$$

i.e., 16 persons (approx.)

With eighty persons in the sales team, the distribution of the completed length of service would be as follows:

Year	No. of Persons
0	16
1	15 (95% of 16)
2	13 (82% of 16)
3	11 (65% of 16)
4	9 (55% of 16)
5	6 (38% of 16)
6	4 (25% of 16)
7	2 (12% of 16)
8	2 (10% of 16)
9	1 (5% of 16)
10	1 (4% of 16)
11	0
12	0

Since fifteen sales people are to be promoted and the promotion would be on the basis of their length of service, the cumulating frequencies in this distribution reveal that a sales person can expect to be promoted after five years of service.

This is ascertained by counting backward, i.e., from *twelfth* year onwards. After fifth year, the total number of persons left is sixteen. Thus, promotion after fifth year is considered better, if fifteen people are required to be promoted on the length of service.

### SUMMARY

Maintenance function is the operation of a pool of resources, i.e., men, spares and tools, to control the level of availability for proper operation of the plant. Thus, maintenance ensures repair, replacement, adjustment or modification, as may be required time to time. This chapter discusses on various aspects of maintenance function like, definition and concept of maintenance, types of maintenance, maintenance policy, concept of learning curve and reliability, spare parts planning and maintenance, maintenance-related problems and its solutions, etc. The chapter focuses on these aspects, to help the students to understand, how an effective maintenance management can ensure flawless functionality of the plant and its machineries.

### Key Words

**Breakdown Maintenance:** It is a traditional form of maintenance, and it requires organizations to make available a separate maintenance team. The services of breakdown.

**Preventive Maintenance:** Normal wear and tear of machines can be avoided by adhering to a Preventive Maintenance Programme. It includes periodic inspection plant by routine adjustment and repair.

**Total Productive Maintenance (TPM):** This kind of maintenance involves all employees of an organization through participation in small group activities. TPM was first introduced in Nippondenso Co. Ltd of Japan in 1969.

**Learning Curve:** Discovered by T.P. Wright in 1936 the Learning Curve was used to analyse the factors affecting the cost of airplanes. Similarly, we can use the Learning Curve to assess manpower requirement, work scheduling, material requirement, planning and even in maintenance management function.

### REVIEW QUESTIONS

1. Discuss the importance of the maintenance function. What is the importance of the Preventive Maintenance Function? How does it differ from Total Productive Maintenance?
2. In what way can we apply the 'Learning Curve Theory' in maintenance management?
3. Draft a suitable maintenance policy for a company engaged in generation and distribution of electricity for handling their customers' complaints. Do you think in such cases, it is appropriate for them to sub-contract the maintenance function?
4. Briefly discuss how we can compute reliability of a system? Is there any difference between Exponential Law of Reliability and Product Law of Reliability?
5. A company is engaged in producing different types of equipments for its use in a steel plant. The company has two different assembly lines to produce particular equipment. The processing time for each of the assembly line is regarded as a random variable and is described by the following distributions:

Process Time (minutes)	Assembly-1	Assembly-2
10	0.10	0.20
11	0.15	0.40
12	0.40	0.20
13	0.25	0.15
14	0.10	0.05

- (a) Using the following random numbers, generate data on the process time for fifteen units of the item and compute the expected process time for the product. For this purpose, read the numbers vertically taking the first two digits for the process time on Assembly-1 and the last two digits for processing time on Assembly-2.

4134	8343	3602	7505	7428
7476	1183	9445	0089	3424
4943	1915	5415	0880	9309

(b) Consider there is skill interchangeability, i.e., same workers can be interchangeably used in both the Assembly lines. If the company requires to producing 500 units in a day, what would be the manpower requirement in an eight-hour working day with 20 per cent fatigue allowance. Show your computation also in terms of man-hour and man-day's basis also.

6. Short Notes:

- Corrective Maintenance
- Predictive Maintenance
- Mean Rate of Failure
- Systems Reliability

## REFERENCES

- Bhattacharyya, D.K. 2000. *Production and Operations Management*. New Delhi: Excel Books.
- Bhattacharyya, D.K. 2006. *Human Resource Planning*. New Delhi: Excel Books.
- Menipaz, E. 1984. *Essentials of Productions and Operations Management*. Englewood Cliffs, N.J.: Prentice-Hall.
- Riggs, James, L. 1987. *Production Systems: Planning, Analysis and Control*. New York: John Wiley & Sons.

# 21

## Quality Management Practices

### LEARNING OBJECTIVES

After reading this chapter, a student would be able to:

- understand the basics of quality management practices
- comprehend how quality management practices exert impact HRD function of an organization
- relate quality management to HRD
- appreciate people-centered issues, which support quality management practices
- know about six-sigma and need for it in developing human resources
- realize the importance of innovation and creativity
- learn the concept of employee empowerment
- be familiar with quality of work life (QWL)
- realize the relevance of quality circles to HRD

### INTRODUCTION

Quality has now become a corporate buzzword, and its definition has changed from the traditional percept, i.e., verification of attributes through an inspection process. This is a post-mortem job. Today, we define quality as the 'totality of features and characteristics' both for the products and services that can satisfy both the explicit and implicit needs of the customers. For organizations, quality is now not an option, but it is the necessity for their survival. Hence, organizations must put their endeavour to meet the expectations of customers. Quality is now an all-encompassing function of management. In the process of meeting customers' expectations, by achieving quality, organizations can also achieve cost reduction, enhanced productivity, teamwork, improved interpersonal communications, etc. This requires, among others, systematic training for the employees of the organizations on problem solving, 'thinking on constraint', lean management,

decision making and also to understand how quality needs can be better synergized with the organizational goals and objectives.

With regard to quality, there is a paradigm shift from old to new realities that even encompass management culture in the organization. Given below is a table that illustrates the same:

Old Realities	New Realities
<ul style="list-style-type: none"> <li>✓ Customer's freedom of choice is limited</li> <li>✓ Quality standards determined by seller</li> <li>✓ Price based on seller's cost plus profit margin requirement</li> <li>✓ Manipulation of customers forcing them to buy</li> <li>✓ One-way communication—Tell and sell</li> <li>✓ Marketing a distinct functional activity</li> <li>✓ Marketing solely responsible for achieving all of the company's primary objective</li> <li>✓ Focus on what's good for the company</li> <li>✓ Products are assets</li> <li>✓ Investment in Plant and Machinery gets priority</li> <li>✓ Physical assets like land, building, machinery and money viewed as the real assets</li> <li>✓ Manufacturing and maximizing production is prime concern</li> <li>✓ Quality the responsibility of QC department</li> </ul>	<ul style="list-style-type: none"> <li>✓ Customer's freedom of choice unlimited</li> <li>✓ Quality standards determined by customer</li> <li>✓ Price determined by what customer is willing to pay</li> <li>✓ Role of marketing is to enhance value and enable customer delight</li> <li>✓ Two-way communication</li> <li>✓ Marketing is everything. The whole business is marketing</li> <li>✓ Marketing is everyone's responsibility from shop floor worker to company chairman</li> <li>✓ Focus on what's good for the customer</li> <li>✓ Only brands are assets</li> <li>✓ Investment in building brand equity gets top priority</li> <li>✓ Brands, corporate image, technology, people skills are key assets</li> <li>✓ Customization, meeting customer requirement prime consideration</li> <li>✓ Quality is everyone's responsibility. TAM is the way</li> </ul>

This paradigm shift is now evident in every organization's mission statement. Quality issues are the focus and quality is in fact one of the important competitive strategies.

From the traditional focus on product quality, the focus has shifted to quality of organization in the total quality management (TQM) era. Corporate houses now get ISO Certification to establish their quality identity, both for achieving internal efficiency and international acceptance.

### WHAT IS QUALITY?

Quality is the 'totality of features and characteristics' both for the products and services that can satisfy both the explicit and implicit needs of the customers. In

a competitive market, organizations cannot survive without quality. Customers buy products and services with certain expectations. Organizations need to put the required endeavour to meet such expectations, offering quality products and services.

### Importance of Quality in Organization

To sustain in a competitive environment, organizations worldwide puts emphasis on achieving quality, as it lowers the cost and at the same time offer value for money to the customers. Mission statements of almost every organization declare that achieving quality is the most important priority to grow in a globally competitive market. It has been already mentioned that traditional focus on product quality has now been changed to quality of organization in the TQM era. Corporate houses, both for achieving internal efficiency and international acceptance, now get ISO Certification to establish their quality identity.

### Cost of Quality

To appreciate the importance of quality, first it is necessary for the organization to understand the meaning and the term 'cost of quality'. Identification of cost of quality and appropriate steps to reduce the same can help an organization in both ways, i.e., cost minimization and increased profitability. To analyse the cost of quality, it is necessary to first classify the nature of cost under three sub-headings as under:

#### Cost of Failure

Quality may fail either internally, i.e., within the organization or externally, i.e., within the customers' premises. Therefore, failure cost can be grouped either as internal failure cost or external failure cost. The cost of rework, the cost for additional raw-materials, additional payments required to be made to workmen, etc., can be accounted under the internal failure cost. In case of any external failure, the cost incurred for re-transportation, re-packaging, servicing and handling of customers' complaints and cost for loss of goodwill are considered, in addition to the cost to be incurred for any internal failure. Experience shows that the cost of failure itself absorbs 70 per cent of the total cost of quality.

#### Cost of Appraisal

For verification of quality, an organization has to incur additional expenses for maintaining an inspection team. Even for carrying out inspection, certain inspection gadgets and tools are required. All the expenses incurred on this account are considered as the cost of appraisal. Usually, an organization spends almost 28 to 29 per cent of the total quality cost.

#### Cost of Prevention

This type of quality cost is incurred when an organization tries to reduce the other two quality costs indicated above. Such expenses are carried out for research and development and human resource development. Expenses on this account normally vary between 1-2 per cent.

Although in Indian organizations, we are yet to make any serious study about computing the cost of quality, from the international perspective, it has been found that such cost, even though not accounted under any separate head, is as high as 40 per cent of the cost of production. In Indian organizations, it is typically assumed that in the normal manufacturing process, there may be some natural rejection, which could be as high as 22 per cent (at least in some cases). This type of rejection rate is called Unavoidable Rejection Rate (UAR) in India. However, in other developed countries, more particularly in Japan, they subscribe to the philosophy of zero defects.

Experience shows that if a company spends mere 1-2 per cent more on the cost of prevention, it can substantially reduce the expenditure incurred on account of other two sub-heads of cost of quality. In fact, the rate of such incremental cost benefit is as high as 70-80 per cent for mere additional 1-2 per cent expenses on the cost of prevention.

Thus, it is evident that cost of quality, even though not apparent from the Books of Account, is a significant wasteful cost factor, which can be reduced substantially to increase the profit of an organization. In fact, the ISO documentation process helps in prune the cost of quality in addition to the augmentation of the internal efficiency of an organization. It also helps to achieve total quality management in a phased manner.

### PRODUCT QUALITY TO QUALITY MANAGEMENT

To understand the quality more appropriately, we must also understand the meaning and concept of total quality management (TQM). A literal definition of TQM, among others, considers it as an organizational improvement strategy through the development of its people. Therefore, quality is intertwined with the management activities of organization. It is already known to everyone that to sustain in a competitive environment, organizations worldwide put emphasis on achieving quality, as it lowers the cost and, at the same time, offer value for money to the customers.

### Principles of Quality Management

With the increased spate of global competition, quality management is now becoming more important in organizations. Every organization, needs to follow quality management principles, as such principles provide guidelines to the organizations on the application of quality management. Therefore, by practising quality management principles both the organizations and their other stakeholders, like customers, suppliers and the society are considerably benefited.

In terms of ISO framework, we can list the following eight quality management principles:

1. **Customer-focused Organization:** Every organization depends on customers, and therefore, it is important for organizations to understand the present and future needs of customers, which may either be explicit or implicit. Organization should not only meet the customers' expectations, they should even try to exceed the expectations of customers.
2. **Leadership:** In organizations, leaders provide the unity of direction. Hence, through quality management practices, leaders should create and maintain

the appropriate internal environment, so that people can work together to achieve the objectives of the organization.

3. **Involvement of People:** Irrespective of the functional areas and hierarchical levels, people are the essence of every organization. Hence, effective use of people resources, among others, should try to make an optimize the benefit for the organizations.
4. **Process Approach:** It indicates management of resources and activities as a process.
5. **Systems Approach:** This principle calls for identification, understanding and management of integrated process of the organization as a system, so as to achieve the desired results.
6. **Continuous Improvement:** For better quality management practices, organizations must focus on quality improvement on a continuous basis, as quality improvement is on-going.
7. **Factual Decision Making:** Efficient quality management requires decision making based on facts, i.e., the data and information.
8. **Mutually Beneficial Organization-Supplier Relationships:** Such relationships with the supplier enhance the motivation of suppliers to create value.

In today's competitive world, quality management helps in leading and operating an organization, so as to achieve a continuous improvement of performance in the long run by addressing the needs of customers and other stakeholders. ISO TC 176 on quality management and quality assurance defines quality management and quality assurance as consensus processes, and accordingly, provided the aforesaid eight quality management principles (QMP) that are more applicable in a business environment.

Successful TQM, therefore, requires behavioural and cultural changes in the organizations. Three management systems are aligned with the TQM initiative in any organization. Those are—

- Organization Management Systems (OM)
- Human Resource Management Systems (HRM)
- Total Quality Management (TQM) Systems in itself

Thus, embracing human resource development and organizational development, organizations, by default, can achieve TQM. From the earlier definition of TQM, i.e. organizational improvement strategy through development of people, in a very simplistic way, we can say HRD + OD = TQM. ISO Standards can be defined as documented agreements that contain technical specifications and other criteria, which are consistent and can be used as rules, guidelines or definitions of attributes. These specifications can make materials, products, services and processes fit for the purpose.

### ISO STANDARDS

Let us first understand the meaning and definition of standards. Standards are documented agreements which detail technical specifications and other precise guidelines for defining the characteristics and features of products and services.

The International Organization for Standardization (ISO) is a federation of international standard bodies from more than 140 countries. It was established in 1947 with the mission to promote development of standards and other quality-related activities to facilitate exchange of goods and services internationally. Also, ISO intends to develop cooperation in all spheres of intellectual, scientific, technological and economic activities. The term 'ISO' is derived from the Greek word *isos*, which means 'equal'. For this reason, International Organization for Standardization is abbreviated as ISO. In engineering, we are familiar with the term 'isometric', which means equal measure of dimensions. Also in law, we use the term 'isonomy', which means equality of laws.

### ✓ The ISO 9000 Family of Standards, Guidelines and Purpose

1. ✓ **ISO 9000:2000. Quality management systems—Fundamentals and vocabulary:** It is the starting point to understand the standard ISO, and basically defines the fundamental terms used in the ISO 9000 family. The purpose of this standard is to avoid misunderstanding.
2. ✓ **ISO 9001:2000. Quality management systems requirements:** This standard helps us to assess the ability of the organization to meet customers' requirements. It is now the only contractual specification, against which certifications are issued to the organizations who meet the specification requirements.  
The new ISO 9001:2000 is an integration of the familiar three standards ISO 9001, ISO 9002 and ISO 9003. ISO 9001:2000 specifies requirements for a quality management system for any organization that needs to demonstrate its ability to consistently provide products that meet customer specifications and applicable regulatory requirements. It aims to enhance customer satisfaction. ISO 9001:2000 has been organized in a user-friendly format with terms that are easily recognized by all business sectors. The standard is used for certification/registration and contractual purposes by organizations seeking recognition of their quality management system.
3. ✓ **ISO 9004:2000. Quality management systems—Guidelines for performance improvements:** This standard provides guidelines for achieving a continuous improvement of quality management systems. This helps the organization to achieve customer satisfaction.

### Examples of the ISO 9000 Standards in Use

Using ISO 9001:2000 Quality Management Systems Requirements, an organization can achieve excellence in quality, not just by conforming to the standards, but also by meeting customers' requirements. All the five sections of the ISO family of standards specify activities which are necessary to implement ISO systems. Each section elaborates the activities which are integral to the quality management practices. Those are:

- Activities used to supply products
- Quality management system
- Management responsibility
- Resource management and measurement
- Analysis and improvement

Requirements of all these five sections are spelt out in the form of guidelines, complying with which, organizations can achieve the desired results.

### ✓ QUALITY GURUS AND THEIR CONTRIBUTION TO TQM PRACTICES

According to Philip Crosby (1988), quality is conformance to standards, which an organization expects to meet. Quality concept comes from the defect prevention training and discipline in work processes. Thus, adherence to quality ensures an organization to achieve the defect-free performance standards. Any organization achieving quality, therefore, can save money, duly correcting the poor workmanship. At the same time, the organization can emerge as the market leader gaining customers' confidence. Philip Crosby is recognized throughout the world as the Quality Guru. Crosby's 'Quality Improvement Process' is based on fourteen steps, following which, an organization can endeavour to achieve quality improvement. Such steps are listed below:

- ✓ Make management committed to quality
- Form cross-functional quality improvement teams
- Measure current processes and develop improved processes duly identifying potential quality problems
- Evaluate the cost of quality and explain its use as a management tool
- Raise the quality awareness and personal concern of all employees
- Take actions to correct problems identified through previous steps.
- Establish progress monitoring for the improvement process
- Train supervisors to actively carry out their part of the quality improvement programme
- Hold a Zero Defects Day to let everyone realize that there has been a change and to reaffirm management commitment
- ✓ Encourage individuals to establish improvement goals for themselves and their groups
- Encourage employees to communicate to management the obstacles they face in attaining their improvement goals
- Recognize and appreciate those who participate
- ✓ Establish quality councils to communicate on a regular basis
- Do it all over again to emphasize that the quality improvement programme never ends

According to Crosby, to emerge as 'Eternally Successful Organization', it is essential for an organization to understand and appreciate the following:

- ✓ People routinely do things right the first time
- ✓ Change is anticipated and used to advantage
- Growth is consistent and profitable
- New products and services appear when needed
- ✓ Everyone is happy to work there

From the HRD point of view it requires, (i) participative management that ensures employee involvement in the decision-making process, (ii) attitudinal change, which reflects through improved responsiveness to customers' (both internal and external) needs, (iii) effective communication (both internal and external), (iv) flexibility, i.e., willingness to accept changes, etc.

Most of the organizations can ensure these through continuous education, team work, focus groups and partnership. Continuous education can be ensured through quality seminars, training and development. Quality team work is possible through nurturing of mutual collaboration and cooperation, making employees endeavour to achieve a common goal. Focus groups provide assistance and involvement for problem solving, and the partnership enhances relationship between individuals, service centres and customers.

Importance of HRD in quality improvement process can be best understood with the following examples. Indian leather manufacturing organizations are facing a major crisis in export market, for improper soaking operations. Improper soaking affects the quality of shoe uppers, which develop multiple wrinkles within a short period of their use and also get torn quickly. To improve the quality, following steps had been taken—

- Defining the problem
- Fixing the problem
- Identifying the root cause
- Taking corrective action
- Evaluating and follow up

Crosby's four absolutes of quality management can be illustrated using the following table:

#### Four Absolutes of Quality

Four Absolutes of Quality		
Conventional Wisdom	Four Absolutes	Reality
Goodness	Definition	Conformance to Agreed-upon Requirements
Appraisal/Inspection	System	Prevention
That's Close Enough	Performance Standard	Zero Defects. Do It Right The First Time (DIRTFT)
Non-Dollar Indices	Measure	Non-conformance Dollars

In his explanation, in *Quality Without Tears*, Crosby (1984) has very correctly exemplified the need for HRD using the Figure 21.1.

Dr W. Edwards Deming, another quality Guru developed a six-fold productivity improvement programmes through quality improvement. Such productivity enhancement initiatives help an organization to reduce scrap and rework. Extending W. A. Shewhart's manufacturing approach to non-manufacturing and human variation, Dr Deming suggested that managers should focus on variability and understand the difference between special and common causes. Special causes for quality variation prevent satisfactory performance. These causes are

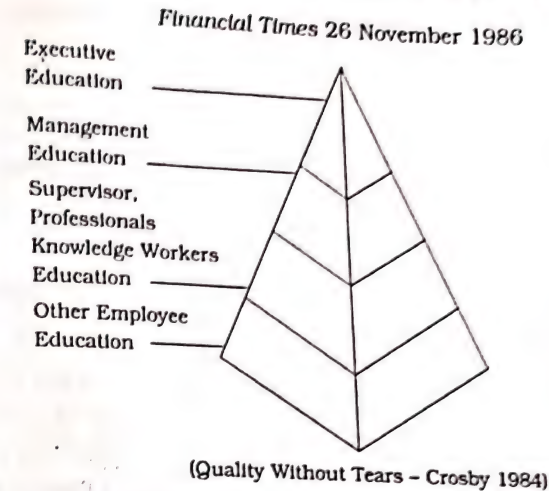


Figure 21.1: Quality and HRD linkages

easily assignable, and after its identification through Deming's statistical quality control methods, an organization can correct the situation by changing operator, shift or procedure. Common causes are those which occur due to the design or due to the operation of the processes or systems. Common causes can be easily identified by the operators, but their elimination would be possible only by making use of management authority. Deming suggested the systematic approach to problem solving, using the PDCA (Plan, Do, Check, Action) cycle. This can lead to better results and efficiency for the organization. However, for practising this, it is essential for the organization to ensure capability development of the people. Deming's PDCA Cycle can be illustrated as under:

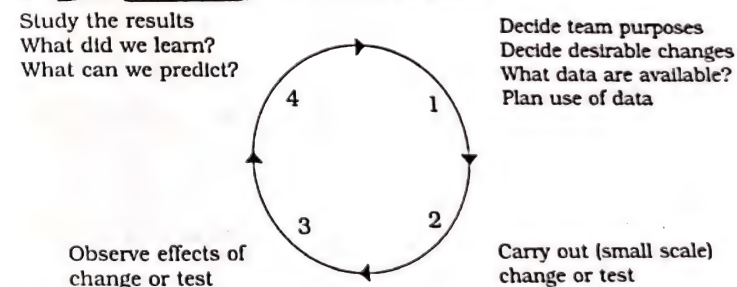


Figure 21.2: PDCA Cycle

Like Deming, Dr Joseph Juran is also another prominent figure in quality management practices. Along with Dr Deming, he was also invited to Japan by the Union of Japanese Scientists and Engineers (JUSE) in 1954. Juran focused on planning, organizational issues and management's responsibility for quality improvement. Training and HRD activities can play a very crucial role in this respect.

Juran's 'Quality Planning Road Map' consists of the following steps:

- ✓ Identify who are the customers
- ✓ Determine the needs of those customers
- ✓ Translate those needs into our language
- Develop a product that can respond to those needs
- Optimize the product features so as to meet our needs, as well as, customer needs
- ✓ Develop a process which is able to produce the product
- Optimize the process
- Prove that the process can produce the product under operating conditions
- Transfer the process to operations

Professor Kaoru Ishikawa, another quality Guru of Japan, has suggested the need for company-wide quality improvement initiatives through quality circle movement. Both Ishikawa and Genichi Taguchi (the other quality Guru from Japan) emphasized the need for making an effective use of statistical techniques for quality improvement, simplifying it by use of Pareto Diagrams and Cause-and-Effect (Ishikawa or Fishbone) Diagrams. Ishikawa's diagrams can find, sort and document the causes of quality variation with the participation of employees of the organization in quality circles or small-group activities. Similarly, Pareto Graphs can plot the quality variation making use of frequency distribution and then can track how elimination of problems can lead to the changes in the quality level. Pareto principle suggests that organization should not try for 100 per cent solution of problems, for obvious interdependence of one problem with another. It is, rather, better to get 100 per cent results with the solution of 80 per cent problems. Other techniques like control charts, scatter diagrams, binomial probability distribution and sampling inspection can also be used for measurement of variability in the quality of products and services.

Company-wide quality control movement, pioneered by Ishikawa not only emphasizes the quality of product, but also the quality of after sales, quality of management and the people as a whole. Some of the important points suggested by Ishikawa, as the outcome of quality control initiatives are:

- ✓ Improvement of product quality and uniformity through reduction in defects
  - Improvement in product reliability
  - Reduction in costs
  - Increase in production volume through rationalization in the production schedules
- ✓ Reduction in wasteful work and rework
- ✓ Improvement in production techniques
- ✓ Reduction in the cost of inspection and testing
- Rationalization of contracts between the vendor and vendee
- ✓ Enlargement of market
  - Improved relationships between departments *suppliers*
  - Reduction in false data and presentation of reports *recipients*

- More free and democratic discussions among the organizational members
- Smooth conduct of meetings
- Rational repairs and installation of equipment and facilities
- Improved human relations

Quality Circles were first started in Nippon Telegraph and Telephone Public Corporation in the year 1962 and were subsequently adopted by organizations throughout the world. The basic aims of the quality circle activities are:

- Contribute to the improvement and development of the organization
- Respecting human relations and nurturing healthy interpersonal relations, which create a culture of compelling workplace
- Full deployment of human capabilities and potentialities

✓ A model cause-and-effect diagram can be presented below:

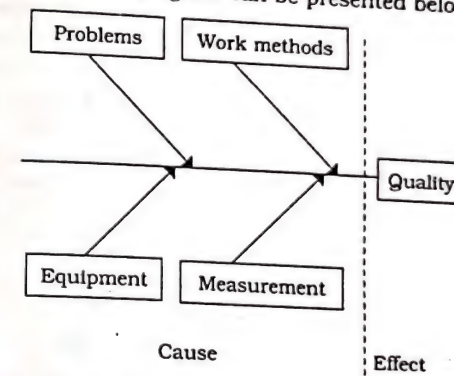


Figure 21.3: Cause and Effect Diagram

Using the above diagram, members of the quality circle team can identify quality-related workplace problems, issues pertaining to cost reduction, productivity improvement and workplace safety and accordingly, can suggest on their own way to improve the same through their mutual participation and cooperation. For overall human resource development, therefore, organizations need to master seven tools through continuous training and development functions. Such seven tools are presented below:

1. Pareto charts
2. Cause and effects diagrams
3. Stratification
4. Check sheets
5. Histograms
6. Scatter diagrams
7. Shewhart's control charts and graphs

Taguchi methodology optimizes products and processes before manufacturing rather than achieving quality through inspection. Taguchi pushed back the concepts of quality and reliability to the design stage to develop the efficient and

error-free manufacturing process. Taguchi methods, however, can also be used to troubleshoot the critical manufacturing problems.

Shigeo Shingo, another quality Guru has also revolutionized the manufacturing of good, suggesting his improvement principles, which help in achieving quality through drastic cost minimization. He has basically provided us the strategy for continuous improvement through the creative involvement of all cross-sections of employees.

Tom Peters, an American management guru, based on his extensive research on successful American companies, evolved a quality improvement with a sales-orientated viewpoint. He had identified leadership as the central factor to the Quality Improvement Process. It is for this he advocated the idea of discarding the term 'management' by the term 'leadership'. He feels 'Managing by Wandering About (MBWA)' is the basis of leadership and excellence. MBWA enables the leader to keep in touch with customers, innovation and people. These three major areas help in achieving excellence in the organization. Peter's MBWA model is illustrated below:



Figure 21.4: MBWA Model

Practising MBWA, a leader can perform three major activities as under:

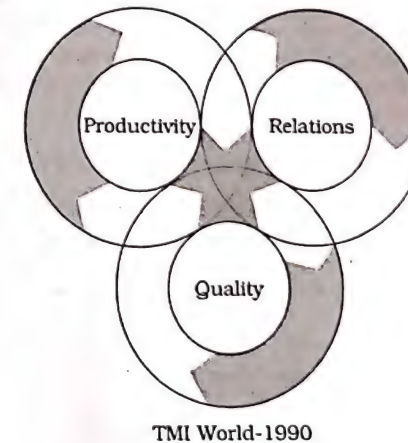
- Listening—suggests caring
- Teaching—values must be transmitted when face to face
- Facilitating—able to give on-the-spot help

According to Crosby, there are twelve traits of successful quality improvement programmes. These traits are:

1. **Management Obsession with Quality:** This emphasizes the emotional commitment to quality, practising certain value systems like, abolition of rework mechanics in the organization in a phased manner, complete rejection of the shoddy goods, etc.
2. **Passionate Systems:** A system without passion is no good for achieving quality. Hence, quality ideology should bind an organization.
3. **Measurement of Quality:** Such criteria should be adequately displayed and should be available to all members of the organization.

4. **Quality Is Rewarded:** Quality achievement should be aligned with the organizational compensation and reward systems.
5. **Everyone Is Trained for Quality:** All members of the organization should be trained enough to understand the quality imperatives. Training on quality is best possible through awareness on cause and effect analysis, statistical process control and other seven tools, discussed above.
6. **Multi-function Teams:** Quality achievement is best possible through the formation of cross-functional teams, small group activities like quality circles, value engineering team, total quality management teams, etc.
7. **Small is Beautiful:** In quality improvement, even a small change can bring big results.
8. **Create Endless 'Hawthorne' Effects:** New goals, new themes, new events are the antidote; hence, continuous focus on change is necessary.
9. **Parallel Organization Structure Devoted to Quality Improvement:** It requires formation of shadow quality teams.
10. **Everyone Is Involved:** Suppliers, distributors and customers all should be the part of the organizational quality improvement process.
11. **When Quality Goes Up, Costs Go Down:** Quality improvement is the primary source of cost reduction.
12. **Quality Improvement Is a Never-ending Journey:** All quality is relative; hence, every day quality of a product or service either becomes better or worse, it never stands still. Therefore, organizations should pursue continuous quality improvement programme.

Claus Moller (1988), the founder of Time Manager International (TMI) is considered as the European quality management Guru, who emphasized the need for improving the personal quality of employees to achieve quality in organization. He developed the model of 'Putting People First'. Moller believed that the administrative process and not the production process offers more



TMI World-1990

Figure 21.5: Moller's Competency Model

opportunity for overall productivity gains. Hence, to achieve quality, organizations must inspire people to do their best, and this would be possible through personal development of employees who can build their requisite competence in three vital areas of productivity, relations and quality. The model documented by TMI is given in Figure 21.5.

### TEAMS AND TEAMWORK

When TQM is successful, employees at every level participate in decisions affecting their work. The most common vehicle for employee participation is a team. Teams range in scope and responsibility from problem-solving groups to self-managed work teams that schedule work, assign jobs, hire members and set the standards and the volume of output. A participative work culture is encouraged when quality becomes everybody's responsibility.

Employee involvement practices in any organization may differ in terms of organizational policies and strategies. Common employment practices are—

- Suggestion System
- Survey Feedback
- Quality Circles
- Formation of Quality of Work Life Team
- Job Redesign
- Formation of Self-Managed Teams
- Formation of TQM Team

Participative management is used as the most important approach for introducing TQM culture in any organization. According to *Yajurveda* (there's a consensus as to the definite time of its composition), people tend to live together in love and amity. More organized or institutionalized approach to workers' participation in management dates back 1920, when Mahatma Gandhi advocated the principles of trusteeship in industry. This idea was further been concretized during the plan era through enactments of various legislations and policy decisions. Despite the benefits of participative management being successfully used for many years by organizations across the world, India was a little late in institutionalizing the approach. Statutory support has now made it mandatory for Indian industries to introduce the culture. Participation in some form or the other has now become virtually unavoidable for many organizations.

### EMPLOYEE EMPOWERMENT

Employee empowerment is to confer legitimate right to employees, irrespective of their nature of job and hierarchical level to make judgements and take decisions on their own. Hence, employee empowerment can facilitate development of problem-solving abilities of the employees. Operationally, in organizations, we empower employees first by developing their capabilities and second by giving them indulgence to commit mistakes. Unlike other quality management approach, empowerment not only calls for employee participation in the operational area, but also allows them to participate in corporate-level decision making, so that employees emerge as a total man. An empowered employee, in other words, is not a mere seller of his time and labour for a contracted sum of money. The empowered

employee acquires necessary skill and authority to own. Employee empowerment, involvement and participative management as important corporate practices have been experimented in several multi-national and national organizations. In all these cases, it was identified that the employee ownership and commitment (which is possible through employee empowerment) are the two ingredients that achieved efficiency and productivity. Some organizations now even empower their employees at the strategic level, rather than confining their involvement only to a limited operational activity.

### QUALITY OF WORK LIFE (QWL)

QWL is most conventionally defined as those perceived important personal needs, which an individual tries to satisfy by working in an organization. Its conceptual foundations, though laid by a host of behavioural scientists, were in reality advocated by Chris Argyris (1975) in his famous work on personality and organization. The Socio-Technical Systems Theory, pioneered by Tavistock Institute of Human Relations, London during 1960s is considered as an important QWL construct. Basic conceptual criteria for QWL incorporate growth and security as important personal needs of an individual. The possibility of furthering one's career within the organization, has, therefore, been identified as one of the important criteria for QWL. Although, common QWL strategists lay emphasis more on job redesign, formation of autonomous work groups and worker participation in management, there exist wide differences among the pioneers in these areas as to what should be construed as QWL factors. The process of QWL can be explained with the help of the following criteria:

- Adequate and fair compensation
- Safe and healthy working conditions
- Immediate opportunity to use and develop human capacities
- Future opportunity for continued growth and security
- Social integration in the work organization
- Work and total life space
- Social relevance of working life

From studies carried out, both in India and abroad, it is evident that the essence of QWL is the opportunity for employees, at all levels, to have substantial influence over their work environment. This is a result of their participation in the decision-making process relating to their work, thereby enhancing their self-esteem and the overall satisfaction from their work. Hence, QWL calls for an open style of management, i.e., sharing of information and genuinely encouraging the efforts relating to the improvement of the organization. This makes it amply clear that QWL is, in fact, an important managerial activity to develop the employees of an organization. The success of TQM programmes largely depend on appropriate HRD interventions like emphasis on continuous training and developmental activities, encouraging participation in management through small group forums, increasing employees' motivation, looking after the career development of employees, employee empowerment, infusing attitudinal changes at the top (like accepting a flatter organization structure, following a democratic approach, becoming receptive to changes on a continuous basis, supporting group performance, etc.).

## QUALITY AND SIX-SIGMA PRACTICES

To add economic value and practical utility to the customers and the organizations, companies nowadays look beyond the total quality management practices. It is now well appreciated by the corporate world that the customers have their rightful expectation to buy quality products at a competitive cost. So organizations should also strive for improving the bottom line (profit). Synergy between these two can be achieved through six-sigma practices. *Sigma* is a business process, which helps organization to improve their profitability and at the same time to achieve customer satisfaction. Six-sigma practices require an organization to design and monitor all its activities in a manner which could minimize the wastes and optimize the use of resources, without, however, compromising with the quality and customer satisfaction. Six sigma is broader than the TQM. TQM mainly detects and corrects the defects of an existing process. Six sigma, on the other hand, requires to recreate a process, so that defects never arise right from the beginning. Hence, six-sigma practices benefit both the organizations and the customers. Organizations get the benefit of increased profits, and customers get the value for their money, availing quality goods and services at a competitive price.

High sigma value indicates good quality and low sigma value indicates less quality products and services. At the six-sigma level, the quality level reaches to a defect-free stage, i.e., only 3.4 defects per million opportunities (DPMO).

Like TQM, six sigma also requires thorough changes in the culture and practices of the organization. Essentially, all the tools mentioned in case of TQM are applicable to six sigma. However, additionally it requires the organization to make people more creative and innovative, since six sigma recreates process to ensure defects never arise.

## QUALITY AND INNOVATION AND CREATIVITY

Innovation is a new technique or idea encompassing product/services, process, managerial styles and even organizational structure. It may be technology-push or demand-pull or even combination of both. Research and development (R&D) activities of an organization are examples of such innovation. In any organization, the need for innovation is primarily felt to keep pace with the competition. It has to be essentially customer focused since this backward linkage facilitates process-centered innovative changes. Whether it is just-in-time (JIT) inventory control, supply chain management (SCM), business process outsourcing (BPO), flexible manufacturing systems (FMS), product/service customization, strategic backward or forward integration, synergy through merger or acquisition, alliances or collaboration, organizational reengineering TQM or six sigma practices, new work culture as the facilitator of organizational change or any R&D initiative for value addition, which broadly encompasses innovation, all stem from customers' explicit or implicit needs.

Mapping customers' needs and aligning the same to innovation initiative is what we need in this competitive world. Innovation is enabled by proactive organizational behaviour practices. It calls for creating a work environment that recognizes creativity, inter-organizational cooperation, rather than competition, working as cross-functional teams, productive meetings for innovative results, introduction of formal innovation programmes and finally, organization's receptivity to new ideas and perspectives. Fostering innovation requires a structured approach. It has to be

broadly in the given context, leadership, values and culture. Contextual analysis helps in building required innovation teams. Leaders facilitate the teams. Values enable adoption of principles, which foster innovation, and finally the culture provides the playing field.

At this stage, it is pertinent to define creativity as innovation. Creativity is often used interchangeably in workplace. Webster Dictionary has defined creativity as 'the ability or power to create, to bring into existence, to invest with a new form, new'. Creativity is, therefore, the core competency. It is the talent of employees of an organization. Competitors can replicate the strategies of an organization but not the creative talents of its employees. To encourage creativity, the organization first has to create the right environment where employees feel safe even to come up with 'dumb' or 'crazy' ideas. In some organizations, creativity is often not encouraged since creative people spend time on contemplation, which is needed for their creative manifestation. So for many, creative people seem to take more time before getting ready for action. They are also more difficult to manage. Organizations, therefore, often see them as major time and money wasters and inhibit their creative thoughts. A review of creativity literature helps us capture creative patterns in following ways:

- A creative process is a balance of imagination and analysis. It involves idea generation, analysis and evaluation.
- Creativity does not stem from subconscious process, as traditionally believed by the classical school of thoughts. It is a purposeful or directed attempt to generate new ideas under controlled situation to help organization to leapfrog in competition. Paul E. Plsek (1997), used the term more appropriately as 'Directed Creativity'. It is a purposeful generation of creative ideas with seriousness of its implementation, whenever it matches with organizational requirements. Non-implementation of at least some ideas (that fit the purpose) will inhibit creativity.

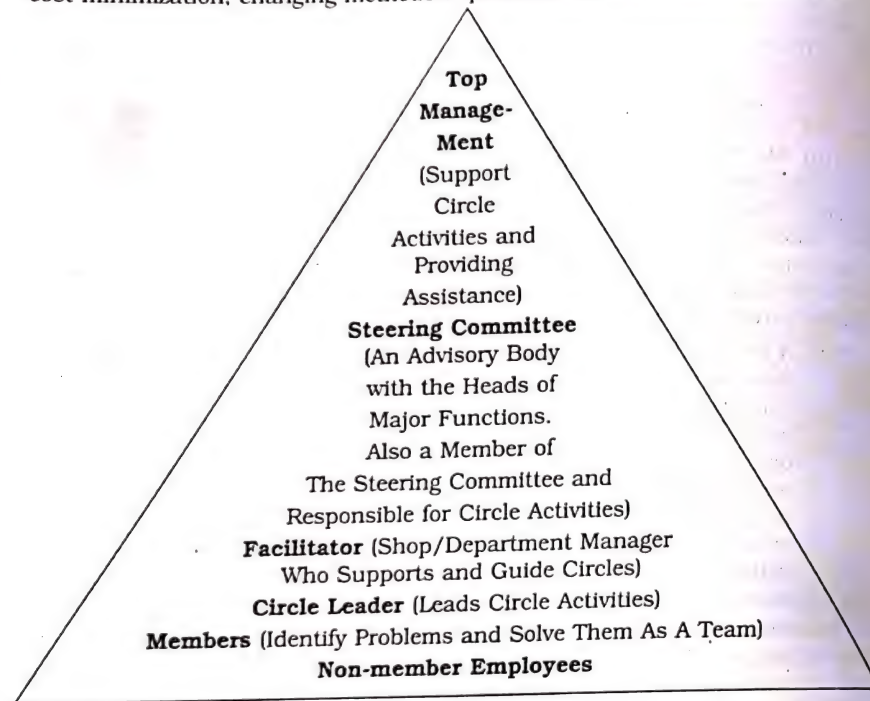
Innovation is the implementation of creative ideas. Therefore, creativity is the sub-set of innovation. Innovation being a holistic concept, here we prefer to use the term interchangeably.

## QUALITY CIRCLES AND TOTAL EMPLOYEE INVOLVEMENT

In the new economy, total participation of workers, as opposed to the statutory participation, is a must. Participation may be through works committees, departmental councils and other representative forums. One such way to enforce total participation is by way of forming quality circles (QC) or small group forums.

QC is an important managerial tool in the organization and can be related to increased employee motivation and productivity. Total knowledge, skill, creative abilities, talents and aptitudes together with values, attitudes and beliefs of the workers and/or individuals can represent an organization's effective human resource inventory. The total involvement of employees is ensured by QCs through a number of small group forums. Organizations have succeeded in improving their productivity by QC activities that increase employee motivation, which is a result that QCs can guarantee more than any other method like complex planning, rigorous execution, etc.

Organizations in India have now started training their workers and employees on QC concepts for its successful implementation. They are systematic about follow-up activity in connection with setting up the QC forums involving all workers, forming homogeneous groups of eight to twelve employees, who regularly meet once in a week for at least an hour to deliberate on work-related problems and to identify possible solutions to those problems. Many organizations have benefited with the cost minimization, changing methods of production, work simplification, etc.



**Figure 21.6: Structure of Quality Circle**

### Top Management

Top management does not participate in quality circle activities but they extend support.

### Steering Committee

Steering Committee overviews the functioning of the quality circles, keeping pace with the organizational perspectives. Some the objectives of the Steering Committee are as under:

- To take an overview/organizational perspective of the operation of the quality circles
- To establish programme objectives and resources
- To provide policy guidance and direction

- To promote quality circles in the organization
- To obtain feedback from facilitators and review circle activities
- To attend 'management presentation' by circles
- To include circles activities as part of the organization goal
- To provide a budget for quality circle activities

### Facilitator

Some the objectives of the facilitator are as under:

- To demonstrate support of the management
- To attend QC meeting at least for brief periods
- To assist the leader in the training of circle members and to reinforce the leader's skills
- To guide the circle to focus attention on their work-related problems and catalyze circle activities
- To coordinate and obtain the support and assistance from other functional areas wherever required by the circles
- To act as an intermediary in resolving circle problems
- To work closely with steering committee as an invitee or member
- To organize mid-term and top management presentations
- To resolve operational problems/hurdles faced by quality circles
- To catalyse other executives to facilitate the successful working of quality circles
- To assume responsibility for the successful operation of the circles in his area

### Leader/Deputy Leader

#### Role

A leader/deputy leader shall own responsibility as a first among equals and shall be accountable for the effective performance of his circle.

#### Functions

- To train members with the assistance of the facilitator/coordinator
- To maintain a sense of identity and a high degree of cohesiveness within his team
- To bring about a consensus in problem solving
- To chalk out action plans and assign roles to members
- To maintain process record/minutes of circle meetings
- To interact with other functional areas in problem solving
- To review progress vis-à-vis goals/objectives set
- To arrange for mid-team and top management presentations
- To serve as a catalyst and encourage non-members to join existing circles or start new ones
- To involve every member in circle meetings/activities

## Members

In quality circles, different members perform different roles. Members are the grassroots level workers, who volunteer for participation in quality circles.

### Role

- To actively contribute on an ongoing basis to the effective functioning of their quality circle, aiming at better performance of their work area in every way

### Functions

- To participate actively in the circle meetings
- To contribute ideas for problem solving
- To assist the leader in data gathering, record keeping, interacting with other areas, etc.
- To build a cohesive team working in the area
- To strive for the highest standards of performance of the circle
- To get involved in improving the total performance of the organization
- To take part in the mid-team/top management presentations

As the basic philosophy of the quality circles is to involve all the employees, vis-à-vis workers in an organization, this total involvement undoubtedly enhance the productivity of the organization. Studies carried out, both in India and abroad, indicate that the successful implementation of quality circles is directly related to the following areas of improvement like: productivity, quality, house-keeping, cost minimization and safety in an organization. For an effective productivity improvement through QCs, the first precondition is to involve trade unions, ensure total participation, institute rewards and recognition systems and focus on continuous training.

CHEVRON Corporation, a leader in the petroleum industry, practices 'direct participation', as an efficient process of designing and implementing change. This helped the company to develop a response capability for the workforce (using their 'collective wisdom') to outmaneuver competitors. The system works like this:

- Organize large-scale conferences (two-three days) involving a variety of stakeholders
- Discuss issues that require change
- Put forward multiple perspectives for action
- Select line of action
- Communicate the same throughout the organization
- Implement identified changes

## STATISTICAL PROCESS CONTROL

Statistical process control helps organizations quickly detect the occurrence of assignable cause or process shifts, to enable investigation into the process and allow corrective action to be taken before any nonconforming units are manufactured. *Assignable causes* are those, which may occur due to improperly adjusted machines, operators' errors and defective raw materials or other inputs. This causes some variability in the quality characteristics. A process, which is

operating under assignable causes over and above change causes, is said to be out of control.

## SAMPLING

Inspection in industry serves the function of determining conformity to specification. There can be inspection of incoming materials, inspection of the processes at several stages and final inspection of the finished product. The problem usually is to decide how much to inspect? Is it possible to examine each and every product? To what extent is it necessary and to what extent feasible? This leads us to the possibility of partial inspection. There are situations, where 100 per cent inspection cannot be employed for reasons like absence of technical feasibility (like life-cycle test of Electric Bulb or destructive test to verify chemical composition of a steel item), lack of time, huge cost involvement, etc. This calls for partial inspection, observations which are generalized for all the units. Such inspection is known as 'sampling inspection'. Its principal uses in industry are:

- Determination of the quality and acceptability of incoming raw materials
- Decision as to the quality and acceptability of semi-finished product for further processing as it passes from one division to other within the factory
- Determination of the quality of outgoing product
- Improvement and control of quality

A sampling plan gives the procedure to be followed for acceptance or rejection of products submitted for acceptance. The product is usually submitted in lots or consignments, and the consumer will accept the lot of high quality products and obviously reject the lot of low quality products. Therefore, it is necessary to decide how the quality of a lot should be measured. The many ways in which the quality of a lot can be described depend mainly on the following characteristics:

- The proportion of defective items in the lot (percentile defective)
- The average number of defects per item or constant area of the lot (defects per item)
- The averages of an important measurable characteristic of the item in the lot and the variability or dispersion among the items of the lot with respect to this characteristic (i.e., the mean and standard deviation for the whole lot)

*Attribute sampling plans* are plans where item quality is defined by attributes and lot quality by fraction defective. Plans, where item quality is an actual measurement and lot quality is specified by tolerances (mean dimension and dispersion), are called *variable sampling plans*.

## OPERATING CHARACTERISTIC CURVE

To judge the suitability of any sampling plan, we need to compare its performance over a range of possible quality levels of the submitted product. A comparison is provided by the Operating Characteristic Curve (or the OC Curve) of the plan. It gives clearly how a sampling plan discriminated lots of varying quality and evaluates the risks associated with any sampling plan.

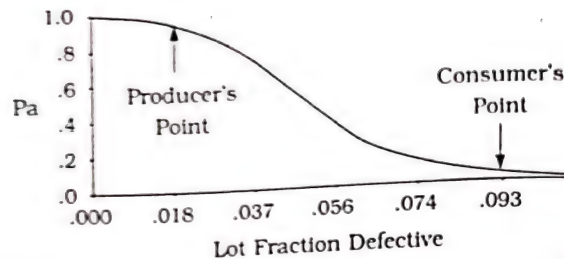


Figure 21.7: OC curve

The above operating characteristic (OC) curve shows the probability of acceptance,  $P_a$  for different levels of lot quality. The horizontal axis here plots the quality characteristic.

There are three important points that are often referred on the OC Curve. These are:

1. Acceptable Quality Level (AQL)
2. Lot Tolerance Per Cent/Fraction Defective (LTPD or LTFD)
3. Point of Indifference

**Acceptable Quality Level (AQL) or Average Acceptable Quality Level (AAQL)** is the level at which the consumer is willing to accept at, all the time. However, due to chance variations the batches may be rejected occasionally even through the quality is better. The probability of such a chance is called 'Producer's Risk'.

**Lot Tolerance Fraction Defective (LTFD) or Lot Tolerance Per Cent Defective** is the level at which the consumer would like to reject at, all the time. When it is expressed in terms of percentage it is called LTPD, and when it is expressed in terms of a fraction, it is called LTFD. The sampling plan involves some risk that will accept a lot having such a chance is called 'Consumer's Risk'.

**Point of Indifference** is the point where the producer and the consumer take the same risk in the application of the plan. So, this is the point where the probability of acceptance and rejection of the lot are equal.

### Single Sampling Plan

The decision to accept or reject a lot is based upon a single sample. So from a homogeneous group, for this type of sampling plan, it is necessary to:

- Make a lot size of 'N'
- Take a random sample size of 'n'
- Inspect all the 'n' units
- If the number of defective items is within 'C' then accept the lot of size 'N'
- If the number of defective items is outside the 'C' limit, then reject the lot size of 'N'.
- 'C' is called the acceptance number or critical number of the plan. If we consider an example with numerical values for the single sampling plan with:

$$N = 10,000$$

$$n = 300$$

$$C = 5$$

The process of operation is as follows:

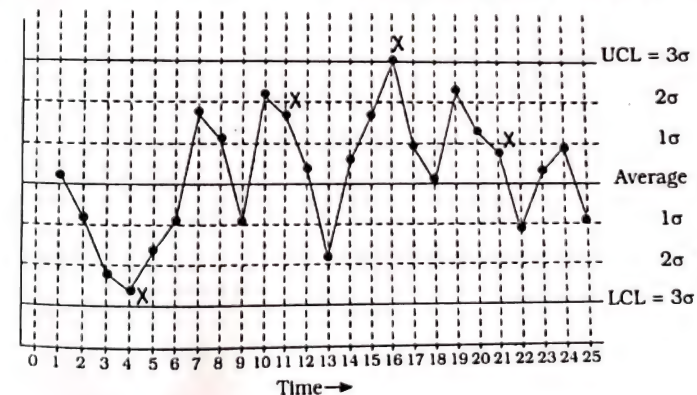
Make a homogenous lot of size 10,000. Out of which choose a sample size of 300 randomly. If it is possible to use random number table to select these 300 units, it is better. Otherwise pick 300 units in an unbiased manner from the lot. Inspect all the 300 units. If the number of defective units is 0, 1, 2, 3, 4 or 5, accept the lot of 10,000 as good. If the number of defective units is more than 5, reject the lot of 10,000.

The selection of the plan for quality control set up depends upon the precision required, the economic aspect implied in the plan and the operational feasibility of the plan in the quality control set up. Operational feasibility changes from company to company and from product to product. The level of precision being attained can be assessed through the OC Curve and Average Outgoing Quality Curve. The Average Outgoing Quality Curve (AOQL) tells us how many bad items we will get if we follow a specified plan. The ordinate of this curve is lot fraction defective  $p$ .

For a specified quality level, the number of defective units that will be accepted is the value of  $p$  for the given  $p$ . This curve rises to a certain limit and drops down afterwards. The maximum point reached by it is called the **Average Outgoing Quality Limit (AOQL)** and it is denoted by  $pa$ . As far as the consumer is concerned, this point is very important because it gives the number of defective units the consumer will get whatever may be the quality of production. It is always an unknown fact how good is the production or the value of  $p$ , so sampling plans can be formulated stipulating the value of AOQL. It is surprising to note that the average outgoing quality ( $pa$ ) decreases when the real quality of production becomes bad, i.e., when  $p$  increases.

### CONTROL CHARTS

A tool for on-line process control, the control chart is widely used for the detection of assignable causes of variation. It is a graphical display of a sample quality measure versus sample number (or time). The centre line represents the average value of the quality characteristic corresponding to the in-control state. Two other parallel horizontal lines, the upper control limit (UCL) and the lower control limit (LCL), are also shown on the chart. A typical control chart looks as follows:



### Choice of Quality Characteristic

To begin with, a decision has to be made on the quality characteristic for which a control programme would be derived. The characteristics affecting the performance of the product should normally be taken first. To take an example, these could be features of the materials, components or parts used, for the tensile strength of some steel item, thickness of some insulation, internal diameters of steel tubes, etc.

### Choice of Control Station

In any manufacturing process, control charts are used at strategic points to conduct proper checks. To decide the ideal place for such controls, it is best to determine the areas of maximum potential for return in the form of direct profits—reduction in scrap, increase in production, etc. It is also worthwhile to study the production process to determine the nature and location of the causes that tend to give rise to deviations in the characteristic chosen.

### Choice of Rational Sub-groups

When creating sub-groups it is best to ensure against sub-groups consisting of items manufactured in different shifts, components obtained from different sources, from different production times, from different machines, moulds, operators, etc.

### Frequency and Size of Samples

A number of practical considerations dictate the size and frequency of samples. Small samples taken at more frequent intervals will detect a large shift more quickly. Samples of size 4 or 5 should generally be used.

### Choice of the Type of Control Charts to be Used

When measuring quality characteristics a pair of control charts, —  $\bar{X}$  to control the average level of the process and the other range ( $R$ ) to control dispersion—would be used. Many quality characteristics are not measured on a numerical scale. In such cases, each unit of product should be judged as either conforming or nonconforming on the basis of whether or not it possesses certain attributes. We could count the number of nonconformities (defects) appearing on a unit of product. In such situations, control charts are used to count the number of defects or of defectives.

As long as the points plot within the control limits, the process is assumed to be in control and no action is necessary. When a point plots outside of the control limits, it is interpreted as evidence that the process is out of control, and an investigative and corrective action is required to find and eliminate the assignable cause or other causes responsible for this behaviour.

### Guidelines for Preparing Control Charts

The guidelines for preparing control charts are given as follows:

### Homogenization for Dispersion

If the sample size chosen is less than ten (usually the sample size is four, five or six), then for each of the samples in the set, the range ( $R$ ) should be first calculated and the average range ( $\bar{R}$ ) should be computed. Depending upon the sample size, a suitable factor  $D$  (denotes deviation) should be read from the table, and if all the ranges are found to be less than or equal to  $D \cdot \bar{R}$ , the initial data collected would be deemed to be homogeneous and acceptable for the purpose of further calculation of control limits. In case one or more ranges are found to exceed  $D \cdot \bar{R}$ , the observations in that (those) sub-group(s) shall be discarded. For the remaining data, the above procedure shall be repeated (i.e., the calculation of the new average range  $\bar{R}$  and comparison of all the remaining ranges with  $D \cdot \bar{R}$ ) till all the ranges are found to be within control.

If more than 25 per cent of the samples are rejected for being out of control in this homogenization process, the entire data should be rejected and fresh data should be collected.

### Homogenization for Central Tendency

Calculate the average of each sample  $\bar{X}$  from the homogenized data. Then calculate the average of these averages or the grand average  $\bar{\bar{X}}$  for all the samples. If any of the averages are found to be outside the interval  $\bar{\bar{X}} \pm A_2 \bar{R}$  (where  $A$  is read from the table value for the corresponding sample size), then the observations in the corresponding sub-groups would be discarded. From the remaining data a fresh grand average should be computed and the above procedure repeated till all the average values are found to be within  $\bar{\bar{X}} \pm A_2 \bar{R}$ .

### Setting Up of Control Charts

The processes of setting up control charts are discussed further:

#### $\bar{X}$ and $R$ Charts

Suppose standard values of the process parameters (i.e., process mean) and the process variability ( $\sigma$ ) are  $\bar{X}$  and  $A$  respectively (when we do not compute the ' $\sigma$ ' value conventionally, i.e., obtaining square-root of variation). Then control limits on  $\bar{X}$  chart and  $R$  chart would be as follows:

#### For $\bar{X}$ chart

$$\begin{aligned}\text{Upper Control Limit (UCL)} &= \bar{\bar{X}} + A_2 \bar{R} \\ \text{Control Limit (CL)} &= \bar{\bar{X}} \\ \text{Lower Control Limit (LCL)} &= \bar{\bar{X}} - A_2 \bar{R}\end{aligned}$$

#### For $R$ chart

$$\begin{aligned}\text{Upper Control Limit (UCL)} &= D_4 \bar{R} \\ \text{Control Limit (CL)} &= \bar{R} \\ \text{Lower Control Limit (LCL)} &= D_3 \bar{R}\end{aligned}$$

### P-Chart or Fraction Defective Chart

P-chart or fraction defective chart is defined as the ratio of the number of defective items in a population to the total number of items in that population. The sample

fraction defective ( $p$ ) is defined as the ratio of the number of defective units ( $d$ ) in the sample to the sample size  $n$ , i.e.,  $p = d/n$ . Suppose the standard value for process fraction defective ( $p$ ) is  $p'$ . Then the central line and control limits on the fraction defective chart would be:

$$UCL = p' + 3 \sqrt{p'(1-p')/n}$$

$$CL = p'$$

$$LCL = p' - 3 \sqrt{p'(1-p')/n}$$

where ' $n$ ' is a sub-group size. If L.C.L. is negative, it is taken as zero.

### ***np-Chart or Chart for Number of Defectives***

The number of defective units or  $np$ -chart is used when the sub-group size is constant. The central line and the control limits for the  $np$ -chart will be as follows:

$$UCL = np + 3 \sqrt{np(1-p)}$$

$$CL = np$$

$$LCL = np - 3 \sqrt{np(1-p)}$$

### ***c-Chart or the Chart for Number of Defects Per Unit***

A defective (or nonconforming) unit is a unit of product that does not satisfy one or more of the specifications. Each specific point at which a specification is not satisfied results in a defect or nonconformity. In this case, each sub-group consists of a single unit and ' $c$ ' would be the number of defects observed in one unit. It should be remembered that each inspection unit must always represent an identical area of opportunity for the occurrence of defects. The control limits for the  $c$ -chart would be given by:

$$UCL = c' + 3 \sqrt{c'}$$

$$CL = c'$$

$$LCL = c' - 3 \sqrt{c'}$$

where ' $c$ ' is the standard value for the average number of defects. If L.C.L. comes out negative, it is taken as zero.

### ***Demerits of the Control Chart***

A disadvantage of the control chart is that it gives equal importance to each class of defects. Different defects are different in their influence on costs. Some can be corrected by simple inexpensive re-work, others could require costly rework and still others could require scrapping of the article inspected. A practical solution to this problem is to classify various defects into some broad categories, e.g., critical, major and minor defects, and then assign the different rating for each class of defects. The merit score for each item is then calculated and can be plotted on the control chart.

#### ***Example:***

Tea produced in Sonajuli Tea Estate is subjected to moisture tests every day. Moisture formation occurs either due to an improper drying operation or due to stockpiling continuously in bins for more than a week. Test checks are carried out

drawing at least five samples (at random) from each lot. On a particular day, the factory manager has drawn five samples ( $n$ ) from ten different lots and recorded his observation on moisture content as under:

Sample	Moisture content				
1	3.389	3.384	3.380	3.386	3.387
2	3.390	3.378	3.387	3.394	3.389
3	3.387	3.389	3.379	3.390	3.384
4	3.389	3.379	3.394	3.394	3.395
5	3.385	3.388	3.394	3.384	3.393
6	3.380	3.389	3.392	3.383	3.388
7	3.379	3.390	3.378	3.377	3.379
8	3.389	3.395	3.390	3.389	3.390
9	3.380	3.395	3.389	3.392	3.392
10	3.386	3.387	3.381	3.389	3.379

Design  $\bar{X}$  and R charts with control limits at  $\pm 3$  standard deviations from the mean. Also suggest whether the process is in control.

#### ***Solution:***

Compute the mean value and the range of each sample. Range is the difference between the maximum and minimum values within a sample.

Sample No.	$\bar{X}$	R
1	3.3852	0.009
2	3.3876	0.016
3	3.3856	0.011
4	3.3902	0.016
5	3.3888	0.010
6	3.3864	0.012
7	3.3806	0.011
8	3.3906	0.006
9	3.3896	0.015
10	3.3844	0.010
Total	33.8690	0.0116

$$\text{Mean of Sample means } \bar{\bar{X}} = 33.8690/10$$

$$= 3.3864$$

$$\text{Mean of Ranges } \bar{R} = 0.0166/10$$

$$= 0.00166$$

Instead of computing standard deviation conventionally, we can approximate this by referring to table value. Thus X chart and R chart would be as under:

 **$\bar{X}$  Chart**

$$UCL = \bar{\bar{X}} + A_2 \bar{R}$$

$$LCL = \bar{\bar{X}} - A_2 \bar{R}$$

**R Chart**

$$UCL = D_4 \bar{R}$$

$$LCL = D_3 \bar{R}$$

Table values  $A_2$ ,  $D_3$  and  $D_4$  are:

$$A_2 = 0.577, \quad D_3 = 0, \quad D_4 = 2.115$$

Thus the X chart and R chart would be as under:

**For  $\bar{X}$  Chart,**

UCL.....	3.3936
$\bar{\bar{X}}$ .....	3.3869
LCL.....	3.3802

**For R Chart,**

UCL.....	0.0245
$\bar{R}$ .....	0.0116
LCL.....	0.0000

**PRODUCTIVITY**

The concept of productivity has received international attention with the declaration of International Year of Productivity in the year 1982. Traditionally, productivity was considered as an input-output relational measurement. Orthodox views, attribute productivity to labour efficiency since the output quantification can immediately be related to labour efficiency. However, this hypothesis suffers from a major lacuna, as many organizations, despite achieving high labour efficiency (measured in terms of value added in manufacturing) suffer from overall dysfunction and become sick.

Though organizations operate on team efforts by distributing different functional areas to different departments, the ultimate success depends on effective joint efforts of different team groups. A lapse in single functional area or areas can offset the efficiency of other functional area or areas, so much so that it may ultimately affect the corporate efficiency.

Even within the ambit of input-output relationship, the concept of input has widely changed under the present circumstances. Inputs are no longer confined within the direct materials used for production but also consider even the supportive functions in more abstract form. Thus knowledge, ideas, etc., have also been thought within the definitional context of inputs. In an organization, production section, in reality, transforms the physical inputs to outputs. However, other functional departments, though not engaged in direct material transformation, provide supportive inputs to production departments for efficient functioning.

With the declaration of the International Year of Productivity in 1982, productivity consciousness has gained worldwide momentum. The concept of productivity was originally enunciated by classical economists like Adam Smith, David Ricardo, J.S. Mill in the 18th and 19th centuries in the form of law of diminishing return to all resources. However, in the 19th century, Frederick W. Taylor's thesis *Shop Floor Management* gave a more reasonable slogan on the issue, i.e., human worth can be made infinitely more productive not by working harder but by working smarter. In India, the productivity movement and consciousness gained momentum with the establishment of National Productivity Council (NPC) in 1958.

Tracing history, we find that the concepts regarding productivity originally emerged during post-war period. After the Second World War, the war-ravaged economy needed urgent reconstruction, renovation and rationalization in all countries. Growth was then everybody's concern, and in such, a milieu growth theory was advocated by the economists.

The interest in economic growth and focus on political, economic, social and cultural relations, anthropological, psychological, institutional, legal, managerial, administrative and host of other related aspects are instrumental in furthering the economic growth.

Following basic economic factors have been unanimously recognized as the crucial factors in economic growth:

- Capital formation for the present and to combat uncertainties in future
- High productivity of all factors of production and inputs (including time and knowledge)

**Definition**

From the economic point of view, productivity means the yield from—

- Each factor of production (land, labour, capital and organization)
- Each input (raw materials, fuel, time and knowledge)
- Overall yield of the joint factors and resources enumerated above in combination

From a common management perspective, productivity in its broadest sense is the quantitative relationship between what we produce and resources which we use. There is a distinct difference between production and productivity. In simple terms, production means a process of transformation of raw materials and other inputs into finished goods or services. However, productivity denotes surplus generation. While production is transforming inputs into output, by adding values, productivity is to get higher output over a given input. The excess output, therefore, tantamounts to surplus generation. Productivity can be increased by interchanging the input ratios, whereas, in such changing process, the outputs will proportionately increase more than the changes in input ratio.

Conventionally, productivity was understood as an inevitable outcome of labour efficiency, i.e., only efficient functioning of the workmen could contribute to the productivity improvement. In a complex corporate system, this emphasis on a single factor gradually has lost its importance as with the single efficiency of workmen, productivity cannot be improved or corporate success cannot be achieved.

Thus, functional efficiency of all other factors of production and all other sub-systems of all such factors have finally been considered as the ultimate goals for overall corporate efficiency. Productivity, thereafter, has been considered as the efficiency of total factors instead of the emphasis on efficiency of labour (single-factor approach).

- Production = value addition to new materials  
 Productivity = efficiency of production  
                   = f (surplus efficiency of all points)  
                   = f (men, materials, management)

### Factors to Improve Productivity

Six important factors affect productivity in an organization. These factors are as follows:

- (a) **Nature and Quality of Raw Materials:** This factor demands better methods to eliminate the awful waste, which is evident in the use of natural resources, and to provide for efficient handling.
- (b) **Basic Nature of Process Employed:** Drive for better methods in using, what is possible the most valuable of any nation's resources, demands that technologies should be used to the best advantage in constantly improved processes. Scientific research should continuously try to improve the processes and the procedures.
- (c) **Amount of Plant and Equipment Employed:** In India, physical effort of a workman is considerably less than many other countries of the world. Technically, it is highly uneconomical from productivity point of view for a man to do work manually, which could reasonably be done by mechanical equipment. Further, it is also counter productive where country's plant, equipment and buildings are obsolete and ill designed. This is due to failure to plough back enough capital for modern equipment for the future profit. In India, this is particularly evident. Technological obsolescence is one of the most important factors for not achieving productive efficiency by the industries. Many industries are practically sluggish in growth and development, and they are retarding day by day. This virtually forces them to finally close down their operations. Thus, it is necessary to ensure that capital resources are used to the best advantage for productive efficiency. Matching investments for plant and equipments for periodic updation of existing technologies is also essential. Such investment pattern varies from, unit to unit.
- (d) **Efficiency of Plant and Equipment Employed:** This factor partly depends on adequate supply of technologies but it equally demand eagerness and action at all levels in a firm to obtain the best from existing resources. To make this eagerness effective, information on production, performance and cost must be made available to all concerned.
- (e) **Volume Continuity and Uniformity of Production:** Standardization of product resulting in longer and more economical runs depends upon finding out the best and the most simple products to fill the market

needs and the best method of making it. Some customer's education may be necessary, but this should not be difficult if the products offered are cheap and satisfying.

- (f) **Utilization of Manpower:** Manpower is the fundamental resource. There is a real need to see that both the general planning and detailed methods of work are not wasteful. The national conference on the role of trade union in productivity improvement organized by the National Productivity Council during February, 1990 in collaboration with Ministry of Labour, Government of India and the International Labour Organization at New Delhi had deliberated on certain important issues of productivity. For the first time at a national level conference, the significance of total factor productivity has been recognized and it was deliberated that increase in productivity would *inter alia* improve the quality of working life of employees.

It was suggested that a national level, a productivity policy should be evolved to improve all aspects of production, such as skill improvement, education of workers, training for attitudinal changes, creation of participative culture and sharing the gains of productivity. The conference emphasized the urgent need for attitudinal changes amongst managers towards workers and unions so that mistrusts and misconceptions could be cleared.

Finally, to understand the spirit of productivity from its true perspective, it is essential to clear some misconceptions that are centred around the aim, scope and purpose of productivity.

- Productivity is not concerned with any group of people but that of every member of the society
- Productivity does not signify just more production but stands for the functional optimization
- Productivity does not mean making the worker work harder
- Productivity does not result in working longer hours or more number of days in the week
- Productivity is not confined to factory and manufacturing organization. It pervades all spheres of economic activities where human endeavor is involved

The labour force should be involved at planning stage for technological changes and productivity improvements. The increased emphasis on small group activities such as quality circles and other consultative mechanism is thought as an inevitable outcome in the years to come to achieve improvement in productivity. While production improvements are important, equally important would be equitable distribution of productivity gains among different partners, namely, labourers, shareholders, consumers and the organizations themselves and the state.

The message of productivity should be percolated down the shop-floor level through necessary training sessions under active guidance of the local productivity councils and the National Productivity Council. Finally, the conference also stressed upon the necessity to get active cooperation from trade unions to spread the message of productivity improvements and to successfully achieve productivity in organization for all economic growth and development of the country.

### Productivity Measurements – Ratio Problem

Conventionally, productivity measurement is left to ratio analysis. This has been illustrated with the help of a small problem.

A company manufactures 50,000 scooters in a year. Each scooter is sold at Rs 25,000. The company spend Rs 5000 per desktop in material inputs and 2,00,000 man-hours to make the scooters. Compute the following productivity ratios problem.

- Output/labour ratio
- Output value/labour ratio
- Value added/labour ratio

**Solution:**

Output/labour ratio (in terms of man-hours):

$$= 50,000 \text{ desktops} / 2,00,000 \text{ man-hours} = 0.25 \text{ desktop per man-hour}$$

Output value/labour ratio (50,000 Desktops  $\times$  25,000 per desktop) / 2,00,000

Man hours = Rs 6.250 per man hour

Value added/labour ratio:

This is computed first by computing the value added, which is

(Output value – material cost)

$$= (50,000 \times 25,000) - (50,000 \times 5,000) = 10,00,000$$

$$\text{So value added/labour (in man-hours)} = 10,00,000 / 2,00,000 \\ = \text{Rs } 5 \text{ per man-hour.}$$

However, this approach towards productivity measurement and linking it straight to wages will neither benefit organization nor it will benefit the workers in the long run for obvious reasons explained earlier.

In today's complex production system, since overall productivity is considered important than labour productivity, for rational pricing of labour (i.e., linking wages), following two models can alternatively yield better results.

#### Omni Factor Model

This model gives a composite productivity index for all input and output costs of all the products. While input costs are taken for all, output costs are determined on the average marginal costs (AMC) method. Input costs are:

- Raw material costs
- Manpower costs
- Capital costs, viz., depreciation, interest, stock investment, etc.
- Indirect production costs
- Cost of utilities

Output costs on the AMC method is worked out as under:

Assuming, we have three products, A, B and C,

*Aggregate Output*

$$= \text{Output A} + \text{Output B} \times \frac{\text{AMC of B}}{\text{AMC of A}} + \text{Output C} \times \frac{\text{AMC of C}}{\text{AMC of A}}$$

Where, AMC percentage of A =  $\frac{\text{Total input costs of A}}{\text{Total output costs of A}} \times 100$

$$\text{Productivity} = \frac{\text{Aggregate output}}{\text{Input costs}}$$

#### Surrogate Models

This model primarily considers some qualitative factors to measure productivity. Factors like satisfaction of investors, employees, customers and suppliers are considered in qualitative terms. Quantification of these qualitative terms is done as under:

$$\begin{aligned} \text{Investors' satisfaction (S}_i\text{)} &= \text{Net Profit/Total Investment} \\ \text{Employees' satisfaction (S}_e\text{)} &= \text{Total value added/Total number of} \\ &\quad \text{manhours} \\ \text{Customers' satisfaction (S}_c\text{)} &= \text{Total Sales Revenue/Total number} \\ &\quad \text{of customers} \\ \text{Suppliers' satisfaction (S}_s\text{)} &= \text{Total purchases/Total number of} \\ &\quad \text{suppliers} \end{aligned}$$

Composite Productivity Index, therefore,

$$A.S_i + B.S_e + C.S_c + D.S_s$$

A, B, C and D are constants, which indicate relative weightage of four parameters.

Linking wages to productivity, based on these two models, yield better results as organizations can objectively price the labour and labourer could also get their legitimate share of productivity gain.

#### Difficulty in Productivity Measurement for Knowledge Workers

Measuring productivity for number of units produced by a worker using a machine is not difficult for the obvious ease of quantification. However, the productivity of knowledge worker is difficult to measure. This is primarily because of difficulty to relate the cost of capital in measurement. Other difficulties can be related to following factors:

- Effects of strategic decision, both positive and negative, may not be immediately evident. Such time lag is, therefore, difficult to relate to a particular time period. Moreover, we cannot directly relate every strategic decision to individual's efficiency and inefficiency. Outcome of some strategic decisions may depend on various external factors, which may be beyond the control of managers.
- Knowledge workers' often extend services to other units of an organization, which may have some effects on the final output, but it is difficult to quantify. To take an example, an advertising manager's efforts in increasing sales are difficult to measure.
- Knowledge workers often contribute indirectly to the achievement of the end result, which is difficult to measure. To take an example, a knowledge worker's contributions towards design and development are

directly attributable to the final output. Yet, his efforts are all the more important.

For all such difficulties, Total Factor Productivity (TFP) study is a better approach, as it considers functional efficiency/performance of all departments of an organization at the aggregate level, without bothering for individual productivity.

### Productivity and Quality

When quality increases, the productivity also improves. This is because wastes and rework are reduced, and inputs are optimally utilized. Higher productivity enables an organization to reduce price and gain competitive advantage both in terms of price and quality. Customers also feel happy as they get value for their money. Since organization's bottom line improves, it raises the satisfaction level of all stakeholders, including employees. The significance of cost of quality has been discussed, while explaining the ISO certification requirements. Saving the cost of quality will have an immediate effect on the enhanced productivity of an organization. All these establish that quality and productivity are indirectly related.

Thus, productivity should not now be misconstrued as labour performance alone. It is the sum total of efficiency and, therefore, linking productivity to wages should be objectively done to create a win-win situation.

In the following table, we have explained human development progress in India and adjoining countries. In the said table, we have explained human development index (HDI) and human performance index (HPI).

Human Development Progress

Country	HDI rank	HPI rank
Sri Lanka	23	22
China	29	18
Maldives	..	..
Myanmar	43	40
India	49	47
Pakistan	50	64
Bangladesh	54	67
Nepal	..	..
Bhutan	63	62

Note: HDI and HPI ranks have been recalculated for the universe of seventy-eight countries.

In the following table, we have explained organizational-level labour productivity data of some of country's leading steel manufacturers, which indicate the year-wise variation of labour productivity. HRD activities in different steel plant played a very significant role in labour productivity.

Labour Productivity Index (Per Tonne per Employee)

Company	1981-82	1986-87	1987-88	1990-91	1994
BSL	71	61	66	98	108
DSP	38	39	41	45	45
RSP	47	44	47	56	56
IISCO	34	29	31	24	29
SAIL	55	51	56	70	78
TISCO	64	74	74	72	72

Irrespective of the steel industries data, India ranks the lowest in labour productivity, as well as, in the overall productivity data. According to the analysis of the Associated Chambers of Commerce and Industry, during the year 2001, India is at the *forty-ninth* position in the world labour productivity per person employed per hour valued at \$2.42 and overall productivity per person against Luxembourg that tops the list with labour productivity valued at \$5,452 as and the overall productivity at \$73,999. Prescriptive model for the correction of the situation is the adoption of flexible work culture and extensive human resource development activities.

### SUMMARY

In organization, total quality management plays a crucial role. To implement total quality management, organization requires to change their employees' attitude and behaviour and achieve complete cultural transformation. Even though some proponents of total quality management believe only in the process improvement aspect, to develop the quality of the products and services, TQM has also a human dimension. TQM *per se* is a complete organizational transformation process, both by process and people centric approaches. Understanding TQM is not possible without a brief appreciation of ISO quality system standards. Although ISO *per se* is not TQM, ISO certification (through internal changes) can pave the way for organizations to achieve TQM. In the process of adopting TQM culture, an organization can transform the behaviour of the people by introducing several employee involvement programmes like quality circles, self-managed teams, employee empowerment, etc. Once TQM is achieved, organizations strive for further improvement, adopting six-sigma practices. But this requires developing the problem-solving abilities, innovativeness and creativity of people. Quality management, TQM and six-sigma practices, adequately elaborate how an organization can sustain in a globally competitive market, leveraging the positive behaviour of the people, through continuous focus on development of people and quality of products and services. Also, in this chapter, we have reviewed the concepts of productivity and explained how quality and productivity improvement can be concurrently achieved by the organization.

## Key Words

**TQM:** Total quality management from HR point of view; it focuses on adopting organizational improvement strategy through development of human resources.

**Participative Management:** It is possible by involving all cross-sections of employees in organizational functions.

**Manpower Redundancy:** Obsolescence of skill and knowledge of people and relinquishing them from the employment.

**ISO:** International Organization for Standardization. ISO standards ensure common quality systems. ISO family has a series of standards and specifications.

**Omni Factor Model:** This model gives a composite productivity index for all input and output costs of all the products. While input costs are taken for all, output costs are determined on the average marginal costs (AMC) method.

**Surrogate Models:** This model primarily considers some qualitative factors to measure productivity. Factors like satisfaction of investors, employees, customers and suppliers are considered in qualitative terms.

## REVIEW QUESTIONS

1. Draw a list of critical skill-sets for software development organizations and suggest how they can manage to develop these skill-sets.
2. What is the role of Quality Management Programme in Human Resource Development functions?
3. Explain the concepts of Employee Empowerment and Quality of Work Life (QWL). How can the human resource development functions in any organization be helped by these two approaches?
4. Explain as an HRD manager, why quality management principles are important areas of consideration.
5. Explain the concept of productivity. How can quality management practices enhance productivity in an organization?
6. What is the difference between the traditional quality concept and the modern quality concept?
7. How does the quality control approach differ with TQM philosophies?
8. Briefly discuss ISO certification norms. In what way can it help an organization to improve their internal efficiency?
9. What is statistical process control? How does it help an organization to improve quality control activities?
10. Short Notes:
  - (a) Quality Circles
  - (b) QWL
  - (c) Employee Empowerment
  - (d) Critical Skills
  - (e) VRS
  - (f) Competencies
  - (g) Productivity Ratios

## REFERENCES

1. Bhattacharyya, D.K. 1995. 'Corporate Body Builder—The Emerging Role of HRD Professional, A Prescriptive Model for Success'. *Indian Journal for Training and Development*, April-June.
2. Bhattacharyya, D.K. 1995. 'Manpower Obsolescence—A study in Indian Ordnance Factories'. International Congress on Economic Transition with Human Face. New Delhi: Indian Industrial Relations Association.
3. Bhattacharyya, D.K. 2000. 'Competency Mapping and Manpower Redundancy—Macro Level Study of India Organizations'. *Management and Accounting Research* 4(2), October-December, pp. 97-105.
4. Bhattacharyya, D.K. 2007. *Human Resource Research Methods*. New Delhi: Oxford University Press.
5. Edward, E., Gordon. 2000. *Skill Wars, Winning the Battle for Productivity and Profit*. Boston: Butterworth-Heinemann.
6. Hamel, G., and C.K. Prahalad. 1990. The Core Competence of the Corporation. *Harvard Business Review* 68(8), May-June.
7. James, A., Christlansen. 2000. *Competitive Innovation Management*. London: Macmillan Business.
8. Jonne, Cesrani, and Peter Greatwood. 2001. *Innovation and Creativity*. New Delhi: Crest Publishing House.
9. Nonaka, Ikujiro, and Hirotaka Takeuchi. 1995. *The Knowledge Creating Company*. New York: Oxford University Press.
10. Paul, E. Plsek. 1997. *Creativity, Innovation and Quality*. Wisconsin: Quality Press.
11. Stolovitch, H.D, and J.G. Maurice. 1998. 'Calculating the Return on Investment in Training: A Critical Analysis and Case Study'. *Performance Improvement* 37( 8): pp. 9-20.
12. www.iso.org.

# Marketing Management

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- comprehend the definition and scope of marketing function
- know about the difference between marketing and selling
- understand the functions of marketing management
- get familiar with the concepts of marketing analysis, SWOT analysis and PEST analysis
- appreciate the need for and requirements of market segmentation
- comprehend the concept of marketing mix
- learn about the link between strategic plan and marketing
- understand BCG Growth Share Matrix/McKinsey/General Electric Matrix/Ansoff's Product/Market Matrix
- know about the marketing environment

## INTRODUCTION

Marketing management is the functional area of business management which is concerned with the direction of managerial efforts to ensure movement of products and services from producers to consumers. Like all other functions of management, marketing management also requires planning, organizing, directing, motivation, coordination and control. According to Cundiff and Still (1971), 'Marketing Management relates to directing those activities, the objective of which are the achievement of marketing goals and which are well planned, organized, coordinated and controlled.' Pride and Ferrel (1977), on the other hand, also emphasized the functional aspects of marketing management defining it as '...the combined effort of different functions of planning, organizing, activating and controlling essential for marketing the functions of exchange easy, quick, smooth, efficient and successful.' Phillip Kotler (1978) defined marketing management as '...the analysis, planning, implementation and control of programmes designed to bring about the desired exchanges with target audiences for the purpose of personal or mutual gain. It relies heavily on the

adaptation and coordination of product, price, promotion and place for achieving effective response.' Summarizing all these definitions, therefore, it is clear that marketing management is the process of managing marketing functions to accomplish organizational goals and objectives.

## SCOPE OF MARKETING FUNCTIONS

Scope of marketing functions, therefore, can be grouped under following categories:

### Analysis of the Market Situation

It is done through observation and survey. Collected data are analysed and appropriate marketing strategies are adopted to make right goods and services available to customers to derive their satisfaction.

### Deciding on Market Goals

Appropriate marketing goals are decided for production and selling of goods and services in different market segments. Setting market goals help in deciding about production planning to cater to the requirements of consumers.

### Creating Marketing Organization

To accomplish the market goals and objectives, appropriate market organization is created duly determining the activities as a whole, grouping of the activities, fixation of responsibility, delegation of authority and ultimately deciding on the proper structure of the organization.

### Procurement and Allocation of Resources

To achieve the goals and objectives, at the outset, essential resources are procured and allocated to different areas as per the plan. Resources cover manpower, machineries, money and even required materials required for marketing. Proper allocations of resources ensure optimization and even help in achieving the trade-off between expenditures and return.

### Market Research

Tastes, habits, preferences of consumers are prone to changes every now and then. Competitors by making their innovative goods and services available, take away the market share of an organization. This requires marketing to capture the information through market research and adjust with the changed situation by making available redesigned products and services or even introducing better value-added products and services, replacing their existing one. Market research also helps in launching new products, renewing the life cycle of existing products and strategy framing, keeping pace with the competitors.

### Controlling of Activities

Like all other managerial functions, marketing management too require to control and to ensure whether marketing activities are being performed in accordance

with the specific plan or charted action. This enables the marketing organization to correct deviations in plan, if any, to ensure that intended goals are achieved.

Hence, the scope of marketing management functions covers all these points 'to achieve desired exchange outcomes with target market.'

### DIFFERENCE BETWEEN MARKETING AND SELLING

The differences between marketing and selling are as follows:

Points of difference	Marketing	Selling
<b>Features</b>	It is a philosophy, a policy of an organization.	Actual transfer of ownership or title of goods or services.
<b>Scope</b>	It has wide scope. It includes not only selling but other activities like advertising, market research, production planning and development, financing, selling, etc.	Selling is limited to exchange of goods for money between sellers and buyers. It basically involves distribution of products, already manufactured in an organization. Selling is a part of marketing. Hence, it has a limited scope.
<b>Focus</b>	Focuses on the needs of the customer or buyer. An organization, duly identifying the needs of the customer attempts to meet such needs by creation of acceptable goods and services.	Limits its focus to the needs of the sellers. This is because increased sales help an organization to increase the profitability of an organization.
<b>Goals</b>	Achieve profit through the satisfaction of customer demand. Hence, it is important to understand which products or services will help the customers to feel satisfied.	It is basically intended to increase profit by means of sales volume. Profit making is primary motto of selling from the sellers' point of view.
<b>Importance</b>	Emphasizes the importance of customers' demand, their liking and disliking.	Emphasizes the need of the seller. Selling is more product-oriented approach.
<b>Policy</b>	Every organization adopts a marketing policy, which covers issues like pricing, market analysis, planning and control, etc. Marketing policy provides basic guidelines for marketing activity in an organization.	In case of selling, market analysis, etc., are not essential since selling ultimately is all about effecting transfer of ownership from seller to buyer with profit-centered policy from sellers' point of view.

(Continued)

Points of difference	Marketing	Selling
<b>Strategy</b>	It gives the direction for marketing. It provides a long-term direction based on which an organization moves ahead to successfully establish them in a competitive market.	It is intended to get immediate result. It is a short-term strategy. Many organizations, adopt their selling strategy keeping in view the present marketing scenario.

### FUNCTIONS OF MARKETING MANAGER

A marketing manager discharges the responsibility of performing marketing activities. Depending on the nature and size of an organization, a marketing manager may either perform whole or some of the activities. Due to the complexities of business and mounting pressure of competition, marketing manager's functions have now assumed the top most priority for achieving success in an organization. They now require professionalism and organized knowledge and skill base, which together develop their competencies to perform successfully in a volatile market condition. Generally, all the functions of marketing, explained earlier, form the basis of functions for a marketing manager. However, to be more specific, a marketing manager's functions cover (i) customer creation, (ii) knowledge about the market, (iii) ability to interpret marketing data, (iv) coordination of the marketing process, (v) policy formulation and (vi) research.

### MARKET ANALYSIS

Market analysis helps us to determine the market situation in terms of its attractiveness or otherwise. Organizations weigh their strengths and weaknesses relating it to the opportunities and threats, to understand their capability to respond to the market changes, based on such analysis. Systematic market analysis benefits an organization in terms of new product development, tracking changing demand pattern of customers. Also this helps in demand forecasting and accordingly scaling up and down the activities of the organizations.

David A. Aaker outlined the following dimensions of a market analysis:

- Market size (current and future)
- Market growth rate
- Market profitability
- Industry cost structure
- Distribution channels
- Market trends
- Key success factors

### MARKET SIZE

Market size is determined based on the current and future sales potentiality of an organization. It is determined by browsing through the information from various sources. A tentative list of such sources can be enumerated as follows:

- Government data
- Trade associations
- Financial data from major players
- Customer surveys

### MARKET GROWTH RATE

Extrapolating the past data into the future, market growth rate can be ascertained in an organization. This is, however, very crude form of estimation of market growth rate, as it cannot account for the fluctuations or any variation in the growth pattern that may occur in future time period for change in any factor or factors, which may influence the market growth. There are many market growth drivers, like, demographic pattern, growth of sales in complementary products, income level, changing lifestyle of users of products and services, changing customers' taste and preferences, etc. For a better estimation of market growth pattern, often it is recommended to use the product diffusion curve. *Product diffusion curve* is developed based on the study of characteristics of adoption rate of similar products or services in the past. This information ultimately helps us to reach the level of maturity. We have already indicated the growth drivers. Some of the indicators of decline phase in a product diffusion curve are price competition, decline in brand loyalty, availability of new substitutes, market saturation, etc.

### MARKET PROFITABILITY

Profitability levels in any organization, to a great extent, are market dependent. Organizations may have different levels of profitability in different market situation, which depends on number of factors. Michael Porter, through his five competitive forces, explained the way to measure the market situation. This framework of competitive forces, to a large extent influences the market profitability. Let us now understand such competitive forces.

- Bargaining power of buyers
- Bargaining power of suppliers
- Entry barriers
- Availability of substitutes
- Rivalry

Such competitive forces exert pressure on market profitability. To take an example, with a high degree of rivalry, i.e., availability of more competitors in the market, price competition increases and market profitability declines. In the reverse case, however, market profitability increases.

### INDUSTRY COST STRUCTURE

Industry cost structure is an important determinant of organizational success or failure. Here, again we can refer Porter's value-chain concept, which helps an organization to add value to products and services, without, however altering the cost. At times, it can even reduce the costs while increasing the customers' satisfaction.

### DISTRIBUTION CHANNELS

Distribution channels facilitate in reaching the products to the end-users on real time basis. Some of the distributions systems, which organizations need to consider while doing market analysis are as under:

- **Understanding of the Existing Distribution Channels:** This helps us to understand how direct the products reach to the customers.
- **Trends and Emerging Channels:** This helps us to assess to what extent new channels can enhance the competitive advantage for the organization.
- **Power Structure of Channels:** Understanding the power structure of channels is very important aspect of market analysis. Organizations with high brand equity can weaken the channels power, as they dictate their terms. Similarly in the reverse case, the channel partners enjoy the higher power.

### MARKET TRENDS

Fluctuations in the market trends could be both an opportunity and threat for an organization. Market trends may be industry specific or general. Industry-specific market trends influence those organizations that falls under the same industry category. General market trends, however, affect all organizations, irrespective of their industry group. Such trends may be in terms of price sensitivity, nature of demand or even regional trends.

### KEY SUCCESS FACTORS

Key success factors are those which help an organization to achieve its market objectives. It also forms an important part of market analysis. Some of the key success factors can be listed as under:

- Accessibility to essential and unique resources
- Competence to reach economies of scale
- Accessibility to channels of distribution
- Accessibility to the state-of-the-art technology

It is important to understand that for any organization, key success factors change over time.

### MARKET SEGMENTATION

Market segmentation identifies market portions that are different from the other. For a given products and services, market can be segmented into different parts, and accordingly, the company can develop their strategies to meet the needs of the potential customers.

#### Need for Market Segmentation

To address the needs for competition better, understanding customers' needs is very important. Market segmentation facilitates adoption of suitable customers' specific or segmented market-specific strategies and accordingly customizes the products and services and remains competitive in the market. It is not possible for any organization to meet every customer's needs; therefore, clustering customers'

needs based on market segmentation provides opportunity to the organization to increase their customer reach and increase profitability. Treating all customers alike, with a mass marketing approach, may ultimately weaken the organization's competitive strength.

Mass marketing means considering market as a homogenous group and offer the same products and services to all customers. Mass marketing in one way cost effective for organization, as it allows economies of scale. Economies of scale are achieved not only in production, but also in distribution, advertising and sales promotion. However, mass marketing cannot address the differing needs and preferences of customers. Such failure ultimately leads to losing of market opportunities and reduces organization's profitability. This is why market segmentation approach for target marketing is so important for organizations.

### Requirements of Market Segments

After understanding the importance of market segmentation, it is now important for us to know the requirements for market segmentation. Effective market segmentation approach requires understanding of the following criteria:

- It should be identifiable so that organizations can measure the differentiating attributes of market segments.
- It should be accessible so that the customers in segmented market can be reached through communication and distribution channels.
- It should be substantial so that the segmented market size is adequate enough to target, else it may not be economical for the organization to address the needs of a small section of customers.
- It should be capable to address the unique needs so that each segmented offerings is different.
- It should be durable so that the segmented market is relatively stable enough to optimize the cost of frequent changes.

A segmented market is internally homogenous but externally heterogeneous, i.e., within a given segmented market, it is homogeneous but between segmented markets, it is heterogeneous.

### Basis of Market Segmentation for Consumer Markets

As market segmentation is more appropriate for consumer markets, here we have indicated the basis based on consumer markets only. Consumer markets can be segmented based on following characteristics:

- Geographic
- Demographic
- Psychographic
- Behavioural

#### Geographic Segmentation

Geographic segmentation is a way of clustering of markets based on geographical variables. Such variables encompass following areas:

- **Region:** It indicates continent, country, state, city, village, or even neighbourhood

- **Size of Metropolitan Area:** It indicates segmentation as per the size of population
- **Population Density:** It indicates number or percentage of people live in urban, suburban, or rural areas.
- **Climate:** It indicates weather patterns in different geographic regions

#### Demographic Segmentation

Demographic segmentation is done based on following parameters:

- Age
- Gender
- Family size
- Family lifecycle
- Generation
- Income
- Occupation
- Education
- Ethnicity
- Nationality
- Religion
- Social class, etc.

Some of these variables, from marketing point of view are expressed in standard categories, while some of these categories have several stages. To take an example, family life cycle can be expressed as bachelor, married (with children and without children), double income group, etc.

#### Psychographic Segmentation

Psychographic segmentation of customers is done as per the lifestyle. Activities, interests and opinions (AIO) surveys can be used for this purpose. Some of the psychographic variables are:

- Activities
- Interests
- Opinions
- Attitudes
- Values

#### Behavioural Segmentation

Behavioural segmentation is done based on the actual customer behaviour of the customers.

Some of the behavioural variables include:

- Type of benefits sought
- Rate of usage
- Brand loyalty
- Status of user: potential, first-time, regular, etc.

- Degree of readiness to buy
- Nature of occasions that stimulate purchases

Behavioural segmentation provides the advantage of using variables, which can be closely related to the product itself, and hence it could be the initial starting point of segmenting the market.

### Basis of Segmentation in Industrial Markets

In contrast to consumer markets, in industrial markets number of customers are relatively less and they tend to purchase in large volumes. Hence, industrial customers go into the nitty-gritty of product details and take ultimate purchase decisions in a group. Industrial customers are mostly organizations like; manufacturers and service providers, resellers, governments and institutions. Some of the market segmentation characteristics, applicable for consumer markets, are also applicable for industrial markets. However, specific market segmentation characteristics, applicable for industrial markets can be listed as under:

- Location
- Company type
- Behavioural characteristics

#### Location

For industrial markets location of customer is important as, based on this, companies work out the cost of transportation, selection of vendors and also takes decisions on complete supply chain. Some companies like paints manufacturer, may even decide to locate their manufacturing base proximate to markets, i.e., customers, for the obvious problem in transporting the finished paints to a long distance, not only for high cost of transportation but also for natural deterioration of quality while the items are in transit. Similar considerations are also applicable for cement industry. Some companies, however, try to locate their warehouses strategically to meet the demands of different markets.

#### Company Type

Type of company is also another important consideration for industrial markets segmentation. Such factors are:

- Company size
- Industry
- Decision making unit
- Purchase criteria

#### Behavioural Characteristics

In industrial markets, patterns of purchase behaviour could also be the basis for segmentation. Such behavioural characteristics are:

- Rate of usage
- Status of buyers like potential, first-time, regular, etc.
- Procedures of purchase like bids, negotiation, etc.

## THE MARKETING MIX

Marketing decisions generally fall into the following four controllable categories:

- Product
- Price
- Place (distribution)
- Promotion

The term 'marketing mix' became popularized after Neil H. Borden published his 1964 article, 'The Concept of the Marketing Mix'. Borden began using the term in his teaching in the late 1940s after James Culliton had described the marketing manager as a 'mixer of ingredients'. The ingredients in Borden's marketing mix included product planning, pricing, branding, distribution channels, personal selling, advertising, promotions, packaging, display, servicing, physical handling and fact finding and analysis. E. Jerome McCarthy later grouped these ingredients into the four categories that today are known as the 4 P's of marketing.

These four P's are the parameters that the marketing manager can control, subject to the internal and external constraints of the marketing environment. The goal is to make decisions that centre the four P's on the customers in the target market in order to create perceived value and generate a positive response.

### Product Decisions

The term 'product' refers to tangible, physical products as well as services. Here are some examples of the product decisions to be made:

- Brand name
- Functionality
- Styling
- Quality
- Safety
- Packaging
- Repairs and support
- Warranty
- Accessories and services

### Price Decisions

Some of the examples of price decisions are given below:

- Some examples of pricing decisions to be made include:
- Pricing strategy (skim, penetration, etc.)
- Suggested retail price
- Volume discounts and wholesale pricing
- Cash and early payment discounts
- Seasonal pricing
- Bundling
- Price flexibility
- Price discrimination

### Distribution (Place) Decisions

Some examples of distribution are given as follows:

- Distribution channels
- Market coverage (inclusive, selective, or exclusive distribution)
- Specific channel members
- Inventory management
- Warehousing
- Distribution centers
- Order processing
- Transportation
- Reverse logistics

### Promotion Decisions

In the context of the marketing mix, promotion represents the various aspects of:

- Marketing communication, that is, the communication of information about the
- Product with the goal of generating a positive customer response.
- Marketing
- Communication decisions include:
  - Promotional strategy (push, pull, etc.)
  - Advertising
  - Personal selling and sales force
  - Sales promotions
  - Public relations and publicity
  - Marketing communications budget

### Limitations of the Marketing Mix Framework

The marketing mix framework was particularly useful in the early days of the marketing concept when physical products represented a larger portion of the economy. Today, with marketing getting more integrated into organizations and with a wider variety of products and markets, some authors have attempted to extend its usefulness by proposing a fifth P, such as packaging, people, process, etc.

Today, however, the marketing mix most commonly remains based on the 4 P's. Despite its limitations and perhaps because of its simplicity, the use of this framework remains strong and many marketing textbooks have been organized around it.

### STRATEGIC PLANNING—THE LINK WITH MARKETING

Businesses that succeed do so by creating and keeping customers. They do this by providing better value for the customer than the competition. Marketing management constantly have to assess which customers they are trying to reach and how they can design products and services that provide better value ('competitive

advantage'). The main problem with this process is that the 'environment' in which businesses operate is constantly changing. So a business must adapt to reflect changes in the environment and make decisions about how to change the marketing mix in order to succeed. This process of adapting and decision making is known as *marketing planning*. Where does marketing planning fit in with the overall strategic planning of a business?

Strategic planning is concerned about the overall direction of the business. It is concerned with marketing, of course. However, it also involves decision making about production and operations, finance, human resource management and other business issues. *The objective of a strategic plan is to set the direction of a business and create its shape so that the products and services it provides meet the overall business objectives.* Marketing has a key role to play in strategic planning, because it is the job of marketing management to understand and manage the links between the business and the 'environment'. Sometimes this is quite a straightforward task. For example, in many small businesses, there is only one geographical market and a limited number of products (perhaps only one product). However, there are cases where the challenge faced by marketing management is immense in a multinational business, with hundreds of business units located around the globe, producing a wide range of products. How can such management keep control of marketing decision-making in such a complex situation? This calls for a well-organized marketing planning.

### Key Issues in Strategic and Marketing Planning

The following questions lie at the heart of any marketing and strategic planning process:

- Where are we now?
- How did we get there?
- Where are we heading?
- Where would we like to be?
- How do we get there?
- Are we on course?

### WHY IS MARKETING PLANNING ESSENTIAL?

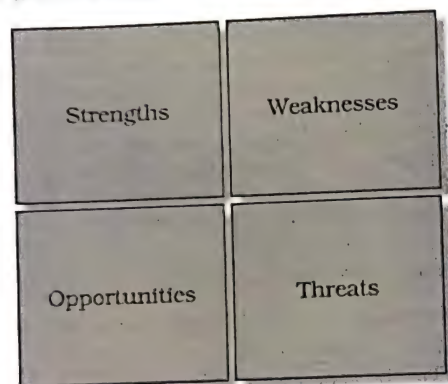
Businesses operate in hostile and increasingly complex environment. The ability of a business to achieve profitable sales is impacted by dozens of environmental factors, many of which are interconnected. It makes sense to try to bring some order to this chaos by understanding the commercial environment and bringing some strategic sense to the process of marketing products and services.

A marketing plan is useful to many people in a business. It can help to:

- Identify sources of competitive advantage
- Gain commitment to a strategy
- Get resources needed to invest in and build the business
- Inform stakeholders in the business
- Set objectives and strategies
- Measure performance

## SWOT ANALYSIS

SWOT analysis is a simple framework for generating strategic alternatives from a situation analysis. It is applicable to either the corporate level or the business unit level and frequently appears in marketing plans. SWOT (sometimes referred to as level and frequently appears in marketing plans. SWOT (sometimes referred to as TOWS) stands for Strengths, Weaknesses, Opportunities and Threats. The SWOT framework was described in the late 1960s by Edmund P. Learned, C. Roland Christiansen, Kenneth Andrews and William D. Guth (1969) in *Business Policy, Text and Cases* (Homewood, IL: Irwin). The General Electric Growth Council used this form of analysis in the 1980s. Due to this, it concentrates on the issues that potentially have the most impact. The SWOT analysis is useful when a very limited amount of time is available to address a complex strategic situation. The following diagram shows how a SWOT analysis fits into a strategic situation analysis.



Source: [www.marketingteacher.com](http://www.marketingteacher.com)

Figure 22.1: SWOT Analysis

The internal and external situation analysis can produce a large amount of information, much of which may not be highly relevant. The SWOT analysis can serve as an interpretative filter to reduce the information to a manageable quantity of key issues. The SWOT analysis classifies the internal aspects of the company as strengths or weaknesses and the external situational factors as opportunities or threats. Strengths can serve as a foundation for building a competitive advantage, and weaknesses may hinder it. By understanding these four aspects of its situation, a firm can better leverage its strengths, correct its weaknesses, capitalize on golden opportunities and deter potentially devastating threats.

### Multiple Perspectives Needed

The method used to acquire the inputs for the SWOT matrix will affect the quality of the analysis. If the information is obtained hastily during a quick interview with the CEO, even though this one person may have a broad view of the company and industry, the information would represent a single viewpoint. The quality of the analysis will be improved greatly if interviews are held with a spectrum of stakeholders such as employees, suppliers, customers, strategic partners, etc.

## Limitations of SWOT Analysis

Though SWOT analysis is useful for reducing a large quantity of situational factors into a more manageable profile, it has a tendency to oversimplify the situation by classifying the firm's environmental factors into categories in which they may not always fit. The classification of some factors as strengths or weaknesses or as opportunities or threats is somewhat arbitrary. To take an example, a particular company culture can be either strength or a weakness. A technological change can either be a threat or an opportunity. Perhaps what are more important than the superficial classification of these factors are the firm's awareness of them and its effort in developing a strategic plan to use them to its advantage.

## INTERNAL ANALYSIS

The internal analysis is a comprehensive evaluation of the internal environment's potential strengths and weaknesses. Factors should be evaluated across the organization in areas such as:

- Company culture
- Company image
- Organizational structure
- Key staff
- Access to natural resources
- Position on the experience curve
- Operational efficiency
- Operational capacity
- Brand awareness
- Market share
- Financial resources
- Exclusive contracts
- Patents and trade secrets

The SWOT analysis summarizes the internal factors of the firm as a list of strengths and weaknesses.

## EXTERNAL ANALYSIS

An opportunity is the chance to introduce a new product or service that can generate superior returns. Opportunities can arise when changes occur in the external environment. Many of these changes can be perceived as threats to the market position of existing products and may necessitate a change in product specifications or the development of new products in order for the firm to remain competitive. Changes in the external environment may be related to:

- Customers
- Competitors
- Market trends
- Suppliers
- Partners
- Social changes

- New technology
- Economic environment
- Political and regulatory environment

The last four items in the above list are macro-environmental variables and are addressed in a PEST analysis. The SWOT analysis summarizes the external environmental factors as a list of opportunities and threats. When the analysis has been completed, a SWOT profile can be generated and used as the basis of goal setting, strategy formulation, and implementation.

When formulating strategy, the interaction of the quadrants in the SWOT profile becomes important. To take an example, the strengths can be leveraged to pursue opportunities and to avoid threats, and managers can be alerted to weaknesses that might need to be overcome in order to successfully pursue opportunities.

### THE BCG GROWTH-SHARE MATRIX

The BCG Growth-Share Matrix is a portfolio planning model developed by Bruce Henderson of the Boston Consulting Group in the early 1970's. It is based on the observation that a company's business units can be classified into four categories based on combinations of market growth and market share relative to the largest competitor, hence the name 'growth-share'. Market growth serves as a proxy for industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix, thus, maps the business unit positions within these two important determinants of profitability.

This framework assumes that an increase in relative market share will result in an increase in the generation of cash. This assumption is often true because of the experience curve: increased relative market share implies that the firm is moving forward on the experience curve relative to its competitors, thus developing a cost advantage. A second assumption is that a growing market requires investment in assets to increase capacity and, therefore, results in the consumption of cash. Thus, the position of a business on the growth-share matrix provides an indication of its cash generation and its cash consumption.

Henderson reasoned that the cash required by rapidly growing business units could be obtained from the firm's other business units that were at a more mature stage and generating significant cash. By investing to become the market share leader in a rapidly growing market, the business unit could move along the experience curve and develop a cost advantage. From this reasoning, the BCG Growth-Share Matrix was born.

The four categories are:

**Dogs:** Dogs have low market share and a low growth rate and thus neither generate nor consume a large amount of cash. However, dogs are cash traps because of the money tied up in a business that has little potential. Such businesses are candidates for divestiture.

**Question Marks:** Question marks are growing rapidly and thus consume large amounts of cash, but because they have low market shares they do not generate much cash. The result is a large net cash consumption. A question mark (also known as a 'problem child') has the potential to gain market share and become a star and eventually a cash cow when the market growth slows. If the question

mark does not succeed in becoming the market leader, then after perhaps years of cash consumption, it will degenerate into a dog when the market growth declines. Question marks must be analysed carefully in order to determine whether they are worth the investment required to grow market share.

**Stars:** Stars generate large amounts of cash because of their strong relative market share, but also consume large amounts of cash because of their high growth rate; therefore, the cash in each direction approximately nets out. If a star can maintain its large market share, it will become a cash cow when the market growth rate declines. The portfolio of a diversified company always should have stars that will become the next cash cows and ensure future cash generation.

**Cash Cows:** As leaders in a mature market, cash cows exhibit a return on assets that is greater than the market growth rate, and thus generate more cash than they consume. Such business units should be 'milked', extracting the profits and investing as little cash as possible. Cash cows provide the cash required to turn question marks into market leaders, to cover the administrative costs of the company, to fund research and development, to service the corporate debt and to pay dividends to shareholders. Since, the cash cow generates a relatively stable cash flow, its value can be determined with reasonable accuracy by calculating the present value of its cash stream using a discounted cash flow analysis.

Under the growth-share matrix model, as an industry matures and its growth rate declines, a business unit will become either a cash cow or a dog, determined solely by whether it had become the market leader during the period of high growth. While originally developed as a model for resource allocation among the various business units in a corporation, the growth-share matrix also can be used for resource allocation among products within a single business unit. Its simplicity is its strength—the relative positions of the firm's entire business portfolio can be displayed in a single diagram.

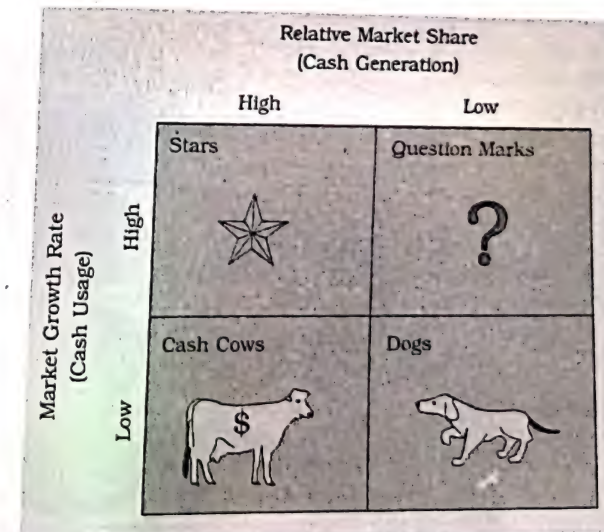


Figure 22.2: BCG Matrix

### Limitations

The growth-share matrix was once used widely, but its popularity has since faded as more comprehensive models have been developed. Some of its weaknesses are:

Market growth rate is only one factor in industry attractiveness, and relative market share is only one factor in competitive advantage. The growth-share matrix overlooks many other factors in these two important determinants of profitability. The framework assumes that each business unit is independent of the others. In some cases, a business unit that is a 'dog' may help other business units gain a competitive advantage.

The matrix depends heavily upon the breadth of the definition of the market. A business unit may dominate its small niche, but have a very low market share in the overall industry. In such a case, the definition of the market can make the difference between a dog and a cash cow.

While its importance has diminished, the BCG matrix still can serve as a simple tool for viewing a corporation's business portfolio at a glance, and may serve as a starting point for discussing resource allocation among strategic business units.

### THE MCKINSEY/GENERAL ELECTRIC MATRIX OR INDUSTRY MATRIX

The McKinsey/GE Matrix overcomes a number of the disadvantages of the BCG Box. Firstly, market attractiveness replaces market growth as the dimension of industry attractiveness and includes a broader range of factors other than just the market growth rate. Secondly, competitive strength replaces market share as the dimension by which the competitive position of each SBU is assessed.

The diagram below illustrates some of the possible elements that determine market attractiveness and competitive strength by applying the McKinsey/GE Matrix to the UK retailing market:

		Market Attractiveness		
		High	Medium	Low
Competitive Strength	High	Tesco	PC World	Box Clever
	Medium	Boots	WH Smith	Body Shop
	Low	Comet	Top Shop	Saxone

- o Mark Share
- o Size/Scale
- o Quality
- o Technology
- o Cost Base
- o Brand Strength
- o Customer Loyalty

- o Size
- o Growth
- o Competitive Rivalry
- o Profit Levels
- o Ability to Differentiate
- o Cyclicalities

Figure 22.3: McKinsey/GE Matrix

### Factors That Affect Market Attractiveness

Whilst any assessment of market attractiveness is necessarily subjective, there are several factors which can help determine attractiveness. These are listed below:

- Market size
- Market growth
- Market profitability
- Pricing trends
- Competitive intensity/rivalry
- Overall risk of returns in the industry
- Opportunity to differentiate products and services
- Segmentation
- Distribution structure (e.g., retail, direct, wholesale)

### Factors That Affect Competitive Strength

Factors to consider include:

- Strength of assets and competencies
- Relative brand strength
- Market share
- Customer loyalty
- Relative cost position (cost structure compared with competitors)
- Distribution strength
- Record of technological or other innovation
- Access to financial and other investment resources

### ANSOFF'S PRODUCT/MARKET MATRIX

The Ansoff Growth Matrix is a tool that helps businesses decide their product and market growth strategy. Ansoff's product/market growth matrix suggests that a business's attempts to grow depend on whether it markets new or existing products in new or existing markets.

Product \ Market	Market	
	Present	New
Present	Market Penetration	Product Development
New	Market Development	Diversification

Figure 22.4: Ansoff's Product/Market Matrix

The output from the Ansoff product/market matrix is a series of suggested growth strategies that set the direction for the business strategy. These are described below:

### Market Penetration

Market penetration is the name given to a growth strategy where the business focuses on selling existing products into existing markets.

Market penetration seeks to achieve four main objectives:

- Maintain or increase the market share of current products; this can be achieved by a combination of competitive pricing strategies, advertising, sales promotion and perhaps more resources dedicated to personal selling
- Secure dominance of growth markets
- Restructure a mature market by driving out competitors; this would require a much more aggressive promotional campaign, supported by a pricing strategy designed to make the market unattractive for competitors
- Increased usage by existing customers; for example, by introducing loyalty schemes

A market penetration marketing strategy is very much about 'business as usual'. A business focuses on markets and products it knows well. It is likely to have good information on competitors and on customer needs. It is unlikely, therefore, that this strategy will require much investment in new market research.

### Market Development

Market development is the name given to a growth strategy where a business seeks to sell its existing products into new markets.

There are many possible ways of approaching this strategy, including:

- New geographical markets; for example, exporting the product to a new country
- New product dimensions or packaging
- New distribution channels
- Different pricing policies to attract different customers or create new market segments

### Product Development

Product development is the name given to a growth strategy where a business aims to introduce new products into existing markets. This strategy may require the development of new competencies and requires the business to develop modified products which can appeal to existing markets.

### Diversification

Diversification is the name given to the growth strategy where a business markets new products in new markets. This is an inherently more risky strategy because in this case, the business moves into markets in which it has little or no experience.

For a business to adopt a diversification strategy, therefore, it must have a clear idea about what it expects to gain from the strategy and an honest assessment of the risks.

### PEST ANALYSIS

A PEST analysis is an analysis of the external macro-environment that affects all firms. PEST is an acronym for the Political, Economic, Social and Technological factors of the external macro-environment. Such external factors usually are beyond the firm's control and sometimes present themselves as threats. For this reason, some say that 'pest' is an appropriate term for these factors. However, changes in the external environment also create new opportunities and the letters sometimes are rearranged to construct the more optimistic term of STEP analysis.



Figure 22.5: PEST Analysis

Many macro-environmental factors are country-specific, and a PEST analysis will need to be performed for all countries of interest. The following are examples of some of the factors that might be considered in a PEST analysis.

#### Political Analysis

- Political stability
- Risk of military invasion
- Legal framework for contract enforcement
- Intellectual property protection
- Trade regulations and tariffs
- Favoured trading partners
- Anti-trust laws
- Pricing regulations
- Taxation—tax rates and incentives
- Wage legislation—minimum wage and overtime
- Work week
- Mandatory employee benefits
- Industrial safety regulations
- Product labelling requirements

### Economic Analysis

- Type of economic system in countries of operation
- Government intervention in the free market
- Comparative advantages of host country
- Exchange rates and stability of host country currency
- Efficiency of financial markets
- Infrastructure quality
- Skill level of workforce
- Labour costs
- Business cycle stage (e.g., prosperity, recession, recovery)
- Economic growth rate
- Discretionary income
- Unemployment rate
  - Inflation rate
  - Interest rates

### Social Analysis

- Demographics
- Class structure
- Education
- Culture (gender roles, etc.)
- Entrepreneurial spirit
- Attitudes (health, environmental consciousness, etc.)
- Leisure interests

### Technological Analysis

- Recent technological developments
- Technology's impact on product offering
- Impact on cost structure
- Impact on value chain structure
- Rate of technological diffusion

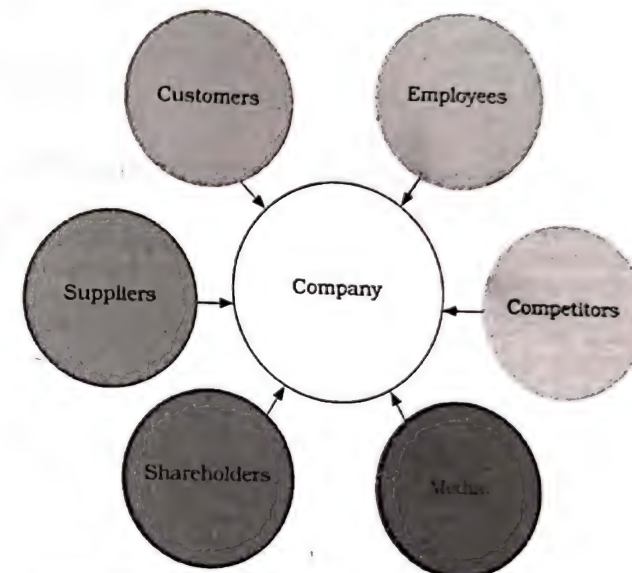
The number of macro-environmental factors is virtually unlimited. In practice, the firm must prioritize and monitor those factors that influence its industry. Even so, it may be difficult to forecast future trends with an acceptable level of accuracy. In this regard, the firm may turn to scenario planning techniques to deal with high levels of uncertainty in important macro-environmental variables.

### MARKETING ENVIRONMENT

The marketing environment surrounds and impacts upon the organization. There are three key perspectives on the marketing environment, namely the 'macro-environment,' the 'micro-environment' and the 'internal environment'.

### The Micro-Environment

This environment influences the organization directly. It includes suppliers that deal directly or indirectly, consumers and customers and other local stakeholders. 'Micro' tends to suggest small, but this can be misleading. In this context, micro describes the relationship between firms and the driving forces that control this relationship. It is more of a local relationship, and the firm may exercise a degree of influence.



Source: [www.learnmarketing.net](http://www.learnmarketing.net)

**Figure 22.6:** Micro Environmental Factor/Stakeholder Analysis

### The Macro-Environment

This includes all factors that can influence an organization, but that are out of the organization's direct control. A company does not generally influence any laws (although it is accepted that they could lobby or be part of a trade organization). It is continuously changing, and the company needs to be flexible to adapt. There may be aggressive competition and rivalry in a market. Globalization means that there is always the threat of substitute products and new entrants. The wider environment is also ever changing, and the marketer needs to compensate for changes in culture, politics, economics and technology.

### The Internal Environment

All factors that are internal to the organization are known as the 'internal environment'. They are generally audited by applying the 'Five Ms' which are Men, Money, Machinery, Materials and Markets. The internal environment is as

important for managing change as the external. As marketers we call the process of managing internal change 'internal marketing.'

It is very important that an organization considers its environment before beginning the marketing process. In fact, environmental analysis should be continuous and feed all aspects of planning. The organization's marketing environment is made up of:

1. The internal environment, e.g., staff (or internal customers), office technology, wages and finance, etc.
2. The micro-environment, e.g., our external customers, agents and distributors, suppliers, our competitors, etc.
3. The macro-environment, e.g., political (and legal) forces, economic forces, sociocultural forces and technological forces. These are known as PEST factors.

### MICHEL PORTER'S FIVE COMPETITIVE FORCES ANALYSIS

Michel Porter suggested five competitive forces and recommended that organizations, before adopting their strategy (related to marketing), need to consider these forces, so that best strategy can be adopted by them. These forces are as under:

Competitive Forces	How It Influences the Organization
<b>Rivalry</b>	The degree of competition that a company faces because of the existence of more number of players in the market.
<b>Bargaining Power of Customers</b>	With the increased bargaining power of customers, firm's competitive position in the market weakens. Hence, any marketing strategy needs to be adopted keeping in view the degree of bargaining power of customer.
<b>Bargaining Power of Suppliers</b>	Suppliers' bargaining power also weakens the firm's strategic position.
<b>Availability of Substitutes</b>	The opportunity for the customers to substitute their requirements. With the increased opportunity, firms' competitive position weakens.
<b>Entry Restriction</b>	Either imposed by the government or the regulatory bodies (in the form of licensing, etc.) or natural restriction due to long gestation period or barriers created by the company itself, occupying the scarce resources like, land, etc. Presence of any form of restriction benefits the organization. Gestation period is the period during which the firm cannot make any profit, for technical bottleneck to achieve commercial run.

Porter suggests that the organization should account for the above competitive forces while framing their marketing strategy and also can make effective use of

generic medicines like, cost leadership, differentiation and change in business focus. If the firm enjoys cost leadership, they will continue to enjoy competitive advantage. To fight against the wools of competitive forces, the firm may also decide to go for product differentiation to distinguish them from the competitors' products or change their business focus altogether. To take an example, IBM changed their business focus from desktop manufacturing to IT-enabled services, as the price competition from HP Compaq, Dell, etc., was mounting.

### SUMMARY

Marketing management is the process of managing marketing functions to accomplish organizational goals and objectives. Scope of marketing management encompasses many areas like, market situation analysis, decision on market goals, creating marketing organization, procurement and allocation of resources, market research, controlling of activities, etc. Again marketing is different from selling in terms of features, scope, focus, goals, importance, policy and strategy. We can also say selling is a sub-set of marketing. A marketing manager need to analyse market in terms of market size (current and future), market growth rate, market profitability, industry cost structure, distribution channels, market trends, key success factors, etc. For a marketing manager, it is also important to understand market segmentation. In this chapter, we have already focused on different types of market segmentation. Marketing also requires controlling 4-Ps of marketing (market-mix), i.e., Product, Price, Place (distribution) and Promotion, keeping in view the internal and external constraints of the marketing environment. The chapter also discusses about the strategy linking with the marketing, highlighting on various models for such strategic analysis.

### Key Words

**Market Research:** Through market research, organizations keep track on the tastes, habits, preferences of customers, study the competitors' strengths and weaknesses, redesign products or launch new products, frame strategies, etc.

**Market Segmentation:** Market segmentation is the identification of portions of the market that are different from one another. Segmentation allows the firm to better satisfy the needs of its potential customers.

**Psychographic Segmentation:** Psychographic segmentation groups customers according to their lifestyle. Activities, interests and opinions (AIO) surveys are one tool for measuring lifestyle. Some psychographic variables include: activities, interests, opinions, attitudes, and values, etc.

**SWOT Analysis:** SWOT analysis is a simple framework for generating strategic alternatives from a situation analysis. It is applicable to either the corporate level or the business unit level and frequently appears in marketing plans. SWOT (sometimes referred to as TOWS) stands for Strengths, Weaknesses, Opportunities, and Threats. The SWOT framework was described in the late 1960s by Edmund P. Learned, C. Roland Christiansen, Kenneth Andrews and William D. Guth.

**The BCG Growth-Share Matrix:** It is a portfolio planning model developed by Bruce Henderson of the Boston Consulting Group in the early 1970's. It is based on the observation that a company's business units can be classified into four categories based on combinations of market growth and market share relative to the largest competitor, hence the name 'growth-share'.

**The McKinsey/GE Matrix:** It overcomes a number of the disadvantages of the BCG Box. Firstly, market attractiveness replaces market growth as the dimension of industry attractiveness and includes a broader range of factors other than just the market growth rate. Secondly, competitive strength replaces market share as the dimension by which the competitive position of each SBU is assessed.

## REVIEW QUESTIONS

1. Define marketing functions. What is its scope? How it is different from selling?
2. What are the important dimensions of market analysis? How does a market analysis help the marketing manager of an organization?
3. Explain the concept of marketing mix. What are its four parameters?
4. What is market segmentation? How does it benefit the marketing programme of an organization?
5. Explain how we can link strategy with marketing. What are the tools and techniques used in strategic marketing management?
6. Short Notes:
  - (a) SWOT Analysis
  - (b) BCG Growth Share Matrix
  - (c) McKinsey/General Electric Industry Matrix
  - (d) Ansoff's Product/Market Matrix
  - (e) PEST Analysis
  - (f) Marketing Environment

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 2005. *Business Management*. Kolkata: Santra Publications.
2. Bhattacharyya, Dipak Kumar. 2008. *Organization Structure, Systems and Design*. Mumbai: Himalaya Publishing.
3. Cundiff, E.W., and P.R. Still. 1971. *Basic Marketing: Concepts, Decisions and Strategies*. New Delhi: Prentice-Hall.
4. Pride, W., and O. Ferrell. 1977. *Marketing: Concepts and Strategies*, 7th edition. Boston: Houghton Mifflin.

# Materials Management and Inventory Control

## LEARNING OBJECTIVES

*After reading this chapter, a student would be able to:*

- appreciate the definitions and concept of materials management and inventory control
- be familiar with various activities involved in materials management
- know about the selective inventory control through various techniques
- understand the concept and theories of Economic Ordering Quantity
- comprehend the process of supply chain management and inventory control

## INTRODUCTION

Materials are one of the vital resource inputs in any production process. Conventionally for any organization five M's resource inputs are vital. Five M's are Men, Machines, Materials, Money and Management. In today's business contexts, however, information and knowledge are also construed as vital resource inputs. Relative importance of such resource inputs, however, varies from organization to organization, though, materials are almost considered as the most vital resource input, for any industry or business. It does not, however, mean making available plenty of materials resources in any organization for its smooth functioning. Holding materials involve costs. For any organization, the prime objective is to maximize ROI (rate of return). ROI is judged with respect to the ratio arrived by dividing the profit/capital employed (investment). While profit is total receipt minus the total expenditure, capital investment is the aggregate of fixed assets and current assets. ROI for any organization can be maximized by increasing total receipts, reducing total expenditures, reducing investments in fixed assets and also by reducing investments in

current assets. Materials' costs are incurred in two ways—cost of materials and the cost on materials. Materials are one of the current assets, and around 40 per cent of the current assets are blocked in inventories of raw materials, consumables, work-in-progress materials (i.e., materials at different stages of production and finished goods). Therefore to maximize ROI, the efficient management of materials assumes importance. It means organization's profitability can substantially increase with materials and inventory control.

For many manufacturing organizations, materials cost alone varies from 40 per cent to 60 per cent of the total costs. This phenomena itself suggests that effective management of materials can benefit the organization to reduce the overall cost. With reduced cost of operation, organizational profitability also increases. Integrated materials management practices require well-coordinated decision-making approach in all management-related activities regarding materials like, material planning and indenting, purchase systems and procedure, variety reduction through standardization and rationalization, reducing uncertainties in demand and supply, handling and transportation, inspection, storage and issue of materials, inventory management, vendor management and finally, disposal of obsolete, surplus and scrap materials, etc.

### MATERIALS MANAGEMENT— DEFINITIONS AND CONCEPTS

Materials management is a coordinated joint action of various materials-related activities to achieve the organizational goal, adopting the integrated approach to plan, acquire, process and distribute materials. Therefore, materials management is a key business function, and it coordinates various materials-related activities like planning, sourcing, purchasing, dispatching and storing, optimizing the cost and also to deliver the customers on time. In today's situation, scope of materials management function extends to new areas like supply chain management, Just-in-Time, value chain management, etc.

Operationally, a materials manager needs to perform various duties like inventory management, value analysis, receiving, storing, managing slow-moving and non-moving materials, etc. Based on the industry practices, we can categorize materials management functions into following four types:

- Planning and control of materials
- Purchasing of materials
- Value analysis of materials
- Physical distribution of materials

It is an approach for planning, organizing and controlling all those activities principally concerned with the flow of materials into an organization. The scope of materials management varies greatly from company to company and may include materials planning and control, production planning, purchasing, inventory control and stores, in-plant materials movement and waste management. Main issues in materials management are:

- Manufacturing and process of value addition
- Operation, keeping pace with the requirements of environment and competition
- Delivery lead time and manufacturing strategies
- Roles of material management functions in an organization

- Supply chain management
- Manufacturing processes

Thus, materials management involves short-time horizon decisions on supplies, inventories, production levels, staffing patterns, schedules and distribution. Typically, materials management decisions are tactical and not strategic, detailed and not aggregate. Inventories are items of potential economic value, which are held ahead of demand. Inventory control in any organization becomes necessary for avoiding diminishing economic value of inventory holding due to deterioration, obsolescence and pilferage. Moreover, excess inventory holding unnecessarily blocks the capital of the organization, which cannot be utilized for other purposes, i.e., it creates a problem of liquidity (cash availability) for the organization.

On the other hand, inventory management becomes necessary for the organization to meet unpredictable demand, to hedge against poor quality, to guard against supply uncertainty and to avail economies of bulk purchase.

Depending on the nature of organization and its areas of activities, type of inventory holding varies. However, most general types of inventory are, raw materials, consumables, spare parts, etc. Organizations, whose production plans are independent of market demand also hold finished inventory for subsequent sales in the market. Cost of raw materials for many manufacturing organizations varies between 35 per cent and 40 per cent in India. Taking into consideration other costs, i.e., general consumables, spare parts and even finished goods, inventory holding costs of many Indian organizations rise to a very alarming level of 30 per cent to 35 per cent. In many world class organizations, with the introduction of Just-in-Time (JIT) inventory control systems, inventory holding costs have reduced considerably. Therefore, we can understand the importance of inventory control and management function in any organization. Benefits of inventory management are to optimize time and place utilities of stock and also to optimize investment in inventory. Wal-Mart, the largest retail chain in the world reduced their inventory holding to less than one per cent introducing RFID systems. RFID is radio frequency identification. It is a device attached to an object that transmits data to an RFID receiver. RFID has advantages over barcodes, as it can hold more data, and it can change the stored data while processing occurs. In the process, RFID helps in effective inventory control, generating automatic orders.

In the following table, we have explained various stages of material cycle to illustrate that inventory control functions encompass all these areas.

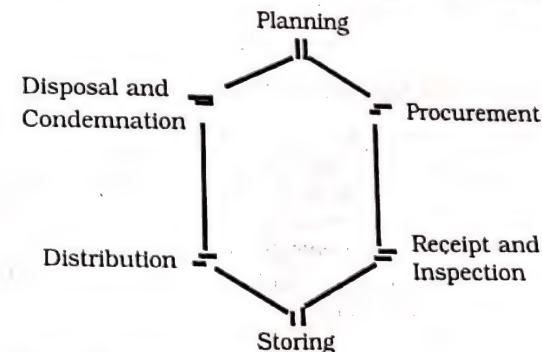


Figure 23.1: Material Cycle

Planning function involves determination of categories of stock based on future demand. Future demand depends on past consumption, changing clientele, priorities of organizational activities. Also, while planning, an organization also requires to specify the quality and the quantity to be procured.

In procurement phase of inventory control, the organization requires to ensure right quality, right quantity, right price, right time and right source of supply. Decision-making areas consider issues like, vendor development, vendor evaluation, rate contract decision and distribution of financial authority of procurement. At the receipt and inspection stage of inventory control, the organization does checking of quantity, physical condition and chemical testing (to verify physical and chemical properties of materials received). However, in all cases, chemical testing need not be necessary.

At the storage stage, areas like location, preservation, layout and materials issue are considered. Location means the exact place where stock piling is done to store the inventory. In some organizations, centralized storage space is used, and all departments draw their requirements from such centralized store. However, for certain items, storage in the specific departments, where the production would be carried out, is considered more appropriate, either because of the size as it may create the problem for lifting heavy item and more from one place to another or because of preservation problem. To take an example, storage of certain items requires environmental conditioning. Hence, preservation issue is also considered while storing the materials or the inventory. Layout is the physical arrangement of storage space. For quick retrieval, it is necessary to store the materials in such a way, so that materials issue can be done much easily and quickly. The other important area of material storage is to determine the system of material issue. Many organizations follow the norms of material issue against the standard intends duly signed by the authorized representatives of the users' section. However, where organizations are centrally controlled, such material issue may require the approval of a designated official, like a purchase controller, etc. Another area of material issue is record keeping. Effective record keeping is done through blind card posting by the store clerk. However, with barcoding and also with the availability of many inventory controls like ERP (enterprise resource planning) modules, such record keeping tasks have now become much easier.

At the final phase of material cycle, disposal and condemnation is done following methods like, mutilation, defacing, segregation, colour coding, etc. Whatever may be the approach for disposal and condemnation, the basic purpose is to separate such materials, so as to avoid its inadvertent use in production.

### SELECTIVE INVENTORY CONTROL

Inventory control requirement varies from item to item. This is why the term selective inventory control is used. Item-wise variation in inventory control systems depends on the cost of the item, nature of criticality, lead time, frequency of use, etc.

Thus, selective inventory control ensures the least loss of energy and efforts, and it also optimizes the cost without enough loss of time.

Depending on the objectives of the organization, we can use following types of selective inventory control techniques.

- ABC analysis
- HML analysis

- VED analysis
- SDE analysis
- GOLF analysis
- SOS analysis
- FSN analysis
- XYZ analysis

### ABC Analysis

ABC analysis is the most elementary type of selective inventory control technique, which is enforced through controlling the value of consumption, depending on the monetary value of the items. To take an example, in any organization, classification of items in terms of its monetary value can be done as follows:

Value of consumption of items (value in Rs)	No. of items	Grade
70 per cent of consumption	10 per cent of no. of items	A
20 per cent of consumption	15 per cent of no. of items	B
10 per cent of consumption	75 per cent of no. of items	C

From the above table, it is clear that the use of high value items, i.e., items classified as A item are consumed maximum within 10 per cent of the total consumption of items, but its monetary value varies between 70 per cent and 75 per cent. In contrast, monetary value of B items ranges from 15 per cent to 20 per cent, and it represents a maximum of 15 per cent of the total items. C items are those which are relatively cheaper and inexpensive, and although 75 per cent of the total items fall under this category, its monetary value is hardly 10 per cent.

ABC analysis, therefore, helps us to understand high, medium and low value items and accordingly take action to optimize the inventory costs.

A illustration of the ABC Model is given below:

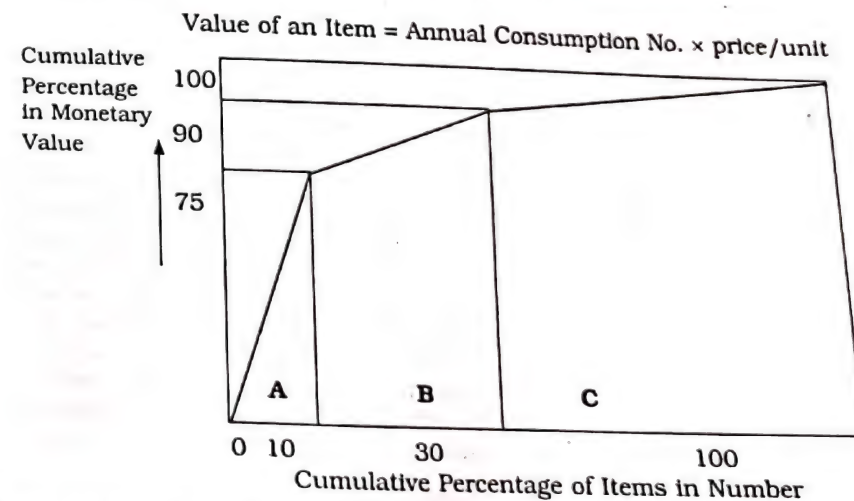


Figure 23.2: ABC Model

### HML Analysis

This is again another inventory control technique, which analyses the item according to its price and classifies it H, M and L types. *H* type items are high priced, *L* types are low priced and *M* types are medium priced. Some of the objectives of carrying out HML analysis are:

- Delegation of responsibility of purchasing to the right level of people, depending on the costs of procurement
- Developing the suitable purchase policies, on the level of inventory holding of H, M and L type of items, manner of procurement of items (like should it be purchased based on EOQ or purchased when it is absolutely necessary), etc.
- Keeping control over consumption at the department level. For this, the authorization to draw materials from the stores will be given to high level H items, low level for L items and medium level for M items
- When it is desired to decide the frequency of stock taking, then very frequently H category, very rarely L category and averagely M category are considered as the basis
- Arranging security arrangements for the items. H items should be under lock and key, L items could be kept open on the shop floor and the M items should be under supervision

### VED Analysis

VED analysis is done to control a critical inventory situation. Through this analysis, we identify the criticality of production situation and accordingly plan for the inventory. Criticality of production is measured, in terms of the gravity of production situation, i.e., the probability of production process coming to a complete halt without the availability of materials. Materials are classified into the three types as under:

- V-Vital
- E-Essential
- D-Desirable

Vital materials are those, without which production will completely stop. For example, due to the absence of bearing, rolling machine cannot operate. Airlines industry is bound to keep stand-by engines as its absence; at times, the industry may require flight cancellation, which costs to the industry an enormous revenue loss. Essential items are those whose cost of non-availability is very high for the organization. For some paper mills, bamboo is an important raw material. Availability of bamboo from the forests, at times, becomes uncertain because of number of reasons. It could be for the problem of insurgency, bad weather conditions, inaccessibility to forest areas due to natural calamities, etc. It is due to these reasons paper mills, which depend on bamboo as raw materials, prefer to stockpile even their six-month's requirement, else production process (which is a continuous one), may adversely get affected. Desirable items are those whose non-availability may not cause immediate loss of production, but may cause some minor disruption in the short run.

Any inventory item may be vital, when its absence may seriously affect the production process or may force loss of production, when its procurement lead time is high, when the item is not a standard saleable item in the market, and finally when the vendor or the supplier is very limited (many times a single supplier) and they are located in far off places.

### How to Conduct VED Analysis?

The process of conducting VED analysis is given below:

#### Step: 1

Identification of factors that are important for performing VED analysis. The table below provides some tentative guidelines:

Sr No	Factor	1st Degree	2nd Degree	3rd Degree
1	Stock out case	Below Rs X	Below Rs X and Y	Above Rs Y
2	Lead time	1-4 week	4-8 week	Above 8 week
3	Nature of item	Commercial item and std item	Non-stock item but according to supplier std	Totally non-standard item
4	Source of supply	Local	Outstation	Imported

#### Step: 2

Assign points or weights to the factors in order of their importance.

#### Step: 3

Divide each factor into three degrees and allocate points to each degree.

#### Step: 4

Make categorization of plans to provide the basis of evolution of items as per the format below:

Categorization plan	
Points	Classification
100-160	D
161-230	E
231-300	V

#### Step: 5

Specify the degree and allocate weight to all the factors.

#### Step: 6

Evaluate to get the final score and make classification of items.

### SDE Analysis

SDE analysis takes into account various purchasing problems on day-to-day basis. Such day-to-day purchasing problems may be for:

1. Non-availability
2. Scarcity
3. Long lead time
4. Geographical dispersion of vendors or suppliers
5. Unreliable supply sources

Materials manager, after performing SDE analysis, allocates the job of procurement to the subordinates who can control the inventory efficiently. This delegation solely depends on the nature of items.

From this perspective, materials can be classified into three categories, like:

- S-Scarce materials
- D-Difficult materials
- E-Easy materials

#### Scarce Materials

Scarce materials are always in short supply. Normally, these materials are either imported in nature or procured from government agencies like Director General of Supplies and Disposals (DGS&D), etc. Due to their nature, these items are procured on yearly interval. These materials are normally in short supply. They can be imported material or can be even procured through government agencies or authorities. For the obvious cumbersome paper works and efforts and expenditure involved, these materials are procured on yearly interval.

#### Difficult Materials

These materials are not very easy to procure, but are available from indigenous sources. Normally, vendors for these materials are geographically dispersed; hence, lead time for procurement of these materials is very high. Even at times, these materials are not standard saleable items; hence, vendors need to customize the requirements of the organizations and may even ask for the developmental costs or tooling costs. Some of the items required by Ordnance Factories in India are of this type.

#### Easy Materials

These materials are those, which are standard in nature and are easily available from the market. Due to their easy availability, organizations may not require to hold these items in large volume in their stock. Normally, for this item, contract purchasing policy is followed.

SDE analysis also helps in formulating purchase policies, based on which all those involved in materials management function can contribute their best. For scarce materials, forward purchasing policies, for difficult materials, schedule purchasing policies and for easy materials, contract purchasing policies are commonly adopted.

### GOLF Analysis

GOLF analysis is similar to SDE analysis, and it is based on the nature of market and suppliers. Both the type of market and nature of suppliers, we determine the quantity of supply, lead time, payments terms, delivery commitments of vendors, etc. Segregation of vendors, based on the variations on the above issues, helps us to classify them into groups, which are considered while taking the decisions on procurement. Suppliers or vendors are classified as under:

- G for government
- O for ordinary or non-government
- L for local
- F for foreign

All these suppliers have their own payment terms, own administrative procedures and so on. For a materials manager, therefore, it is important to keep in mind all these typical issues to function efficiently and smoothly.

### SOS Analysis

SOS analysis is done, keeping in view the seasonality or non-seasonality of the item. When the item is seasonal in nature, purchase problems and workload vary. SOS analysis helps to classify the items into two groups:

- S stands for seasonal items
- OS stands for non-seasonal items

Based on seasonality and non-seasonality of the items, procurement actions vary. To take an example, in case of sugar mills or for jute mills whose procurement is seasonal, these companies need to procure their requirement for a longer duration so as to adjust their production plans. Some seasonal items are available for a shorter duration or for a longer duration. Green tea leaves are available for a longer duration from February to October, whereas, jute is available only during rainy season. Non-seasonal items are available throughout the year without any major price variation. Since seasonal items, which are available for a limited period, are procured in bulk to manage the production process throughout the year, organizations can avail huge price discount but they may face the problem of storage. Problem increases, when the items are perishable in nature. Seasonal items, which are available throughout the year, need not be procured in bulk. In this case, organizations may lose the price discounts, but they substantially save the cost of inventory carrying.

### FSN Analysis

This analysis is done based on the movement of item. 'F' items are those which are fast moving in nature in a given time period. However, fast moving does not mean that these items are consumed in bulk but their pattern of consumption is frequent. 'S' items are slow moving in nature and are required occasionally. 'N' items are non-moving in nature, and they may not be demanded by the user sections for a long time duration.

Based on this analysis, materials section manages and operates the stores and decide the procurement actions. To illustrate, materials department arranges the fast-moving items close to the point of issue to reduce the time loss for material handling. Similarly, slow-moving and non-moving items need to be stacked in order to optimize the stores space. From the point of view of inventory control, FSN analysis helps, since organizations can avoid unnecessary procurement of slow-moving and non-moving items, putting them in liquidity crunch.

### XYZ Analysis

This analysis is made based on the value of left out stock in the stores. 'X' items are those whose value of left out stock is very high. 'Y' items are those whose left-out stock value is moderate. 'Z' items are the residual items, whose left-out stock value are neither high nor moderate, i.e., is very low. Materials managers, based on such analysis, can plan not only for procurement but also for secured storage of items.

### ECONOMIC ORDERING QUANTITY

Economic ordering quantity indicates order of optimum quantity of materials keeping in view that the cost of ordering and inventory holding is minimum. This is a test of reasonableness, commonly known as Wilson EOQ Model. It was developed by Harris in 1913; however, its application, offering in-depth analysis was pioneered by R.H. Wilson. This is why as an acknowledgement of his contribution, the EOQ Model is called a Wilson Model.

We have following assumptions of the EOQ Model:

- Unchanged or constant cost of ordering
- Demand pattern is constant
- Fixed lead time
- Procurement price of the item is constant, i.e., no consideration for discount
- Instantaneous replenishment

At the EOQ level, costs of ordering and inventory carrying become minimum.

### EOQ Variables

For computing EOQ, we require quantitative value of following variables:

- $Q$  = order quantity
- $Q^*$  = optimal order quantity
- $D$  = annual demand quantity
- $P$  = per unit purchase cost
- $C$  = per order fixed cost
- $H$  = per unit annual holding cost (also known as inventory carrying cost)

### Total Cost Function

Using the total cost function, we can compute the single-item EOQ formula, which shows that at the EOQ level, ordering cost and carrying cost remain equal. The formula is as follows:

$$\text{Total Cost} = \text{Purchase cost} + \text{Ordering cost} + \text{Holding cost}$$

1. **Purchase Cost:** Variable cost of goods, indicated by per unit purchase price  $\times$  annual demand of quantity, indicated by  $P \times D$ .
2. **Ordering Cost:** Cost of placing the orders, which is fixed and indicated by  $C$ . Assume each order has the fixed cost of ordering, i.e.,  $C$ , and our hypothetical organization needs to order  $D/Q$  times per year. This is indicated by  $C \times D/Q$ .
3. **Holding Cost:** This indicates that average quantity of materials lying in the stock, and it is represented by  $Q/2$  (which indicates between full replenishment and empty), cost of which is indicated as:  $H \times Q/2$ . The average quantity in stock (between fully replenished and empty) is  $Q/2$ , so this cost is  $H \times Q/2$ .

The derivation of this formula, therefore, is that solution of  $Q$  gives  $Q^*$ , i.e., optimal quantity of order.  $Q^*$  is independent of  $P$ , i.e., it is the function of only  $C, D, H$ .

Inventory control in any organization is of prime importance. It helps in time and costs savings. Balanced inventory holding avoids unnecessary inventory holding costs and also benefit the organization by not exposing it to the problem of obsolescence. Problem of obsolescence may even force an organization to face the crisis of bankruptcy. EOQ model ensures trade-off between the costs of inventory holding and costs of re-ordering, which in the process minimizes the total costs of inventory. Important costs of inventory are the costs of ordering, costs related to placement of order, costs of inventory holding or carrying. All these costs, that are variable in nature, are considered in the EOQ Model. Purchasing cost, which is constant, is not considered in this model.

Let us now understand various components of costs.

**Annual Usage/Demand:** We express these costs in terms of units, i.e., the predicted annual demand or usage. In EOQ equation, this cost aspect can be easily determined, once we arrive at the annual predicted demand.

**Order Cost:** This cost is the purchase cost or set up cost, and arrived at by summing up the fixed costs that is incurred by the organization every time the order is placed. To be more specific, this cost relates to the activities involved in processing the order, like costs for placing purchase order or requisition, costs for purchase approval, costs to process the receipt of the purchase items, costs incurred for incoming inspection, processing of invoice and payment to vendors. In some cases, we can also consider inclusion of in-bound freight (i.e., for the materials received) in the cost of ordering. Hence, these costs depend on the order frequency, and not really on the quantities ordered. For placing any order, organizations need to spend time. Such time costs are included in the order costs. A tentative detail of time costs can be given as follows:

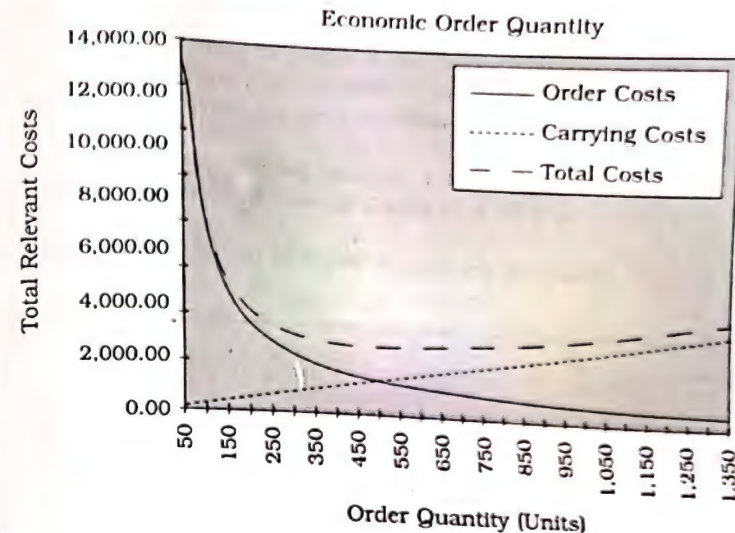
Type of Time Spent	Reasons for Time Spent
For checking the receipt, entering the receipt and for doing other related paper work	These are important to match the receipt with the order and to maintain proper records, as these are essential documents for future audit
Time spent repacking materials, unloading trucks and delivery to other departments	Some organizations consider such time loss also in cost of ordering, while others do not consider these costs. However, it is more of a convention not to consider these costs, as these are incurred only after placement of order
Time spent to inspect a fixed quantity per receipt and its repacking	However, time spent for quality inspection in conformity with the technical specifications and process is not considered, as these costs are included in the cost of inspection
Time spent to prepare the purchase order, to get it approved, to contact and negotiate with the suppliers or vendors, to expedite vendors for timely delivery, to review the order reports and forecasts, etc.	In some cases, organizations get quote every time they order for, such costs for ordering being very negligible, organizations as a convention exclude this
Time spent to deal with the vendor invoices	Vendors or suppliers send their invoices along with every supply, which require verification and subsequent matching with the receipt

**Inventory Carrying or Inventory Holding Costs:** Inventory carrying or holding costs are the cost associated with the cost of stocks lying in the stores. Mainly two costs are included in the inventory carrying or holding costs—Interest costs on investment made on idle inventory and the cost of storage. In EOQ, inventory carrying or holding costs are computed based on the annual cost per average on-hand inventory unit. Thus, inventory carrying costs are variable and depend on the inventory levels.

Primary components of inventory carrying costs are—interest on investment made on the inventory, cost of insurance (as it directly relates to the inventory value) and the cost of storage.

### Graphical Solution of EOQ Model

If we minimize the sum of the ordering and carrying costs, we also need to minimize the total costs. To help visualize this, we can graph the ordering cost and the holding cost as shown in the following chart:



With the minimization of the sum of the ordering and carrying costs, we can minimize the total costs. The above chart plots costs on the vertical or Y axis and order quantity on the horizontal or X-axis. The straight line from the origin is inventory carrying cost curve. With more order on the X-axis, inventory carrying cost line increases proportionately. The curve that slopes downwards, commencing from Y-axis, decreases more as it approaches to X-axis. This is the total ordering cost curve, which depends on the volume of order quantity. With the increase in the ordering quantity, ordering cost will decrease, and thereby will result to fewer orders in a given time period. The intersection point of the two curves, minimum total costs, i.e., the level where inventory carrying cost and ordering costs optimize, and the organization can conveniently decide the EOQ level ordering quantity.

Stock holding or inventory carrying costs are incurred while keeping the stock overtime. We have already discussed the nature of other costs above. Conceptually speaking, often some of these costs elements, although relevant, are difficult to represent in numeric figure. Nevertheless, we need to apportion, say for example, the overhead costs (costs for heating, lighting, security coverage of storage areas) to fit those into EOQ models, so that we can optimize the inventory costs. Let us now understand various EOQ models.

### Basic Model of EOQ

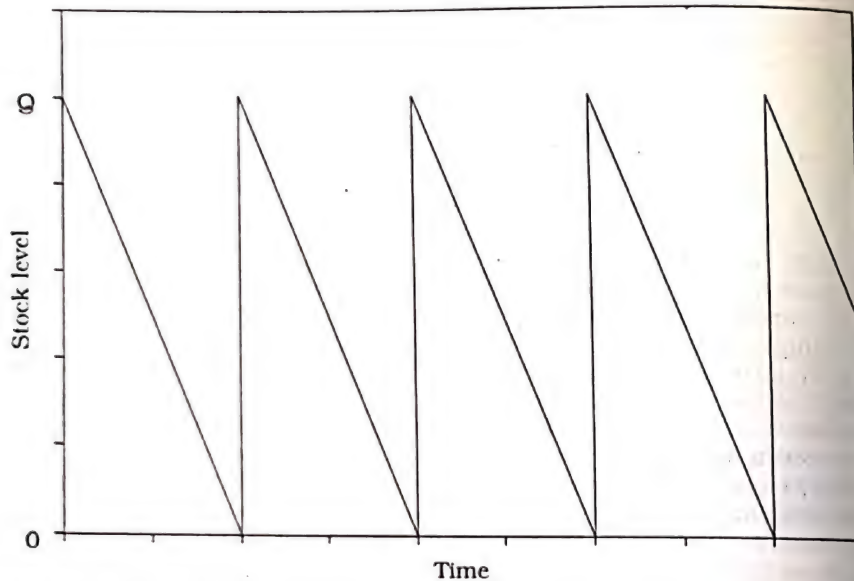
In the basic model of EOQ, we consider the following situation, where—

- Organization places orders to a supplier
- The supplier delivers exactly the quantity asked for
- The organization passes the supplied items either to the internal customers or to the external customers. Internal customers indicate various divisions and departments within the organization, who make use of these supplied items to transform it to the finished goods

Assumption:

- Stock used at a constant rate, say  $R$  units per year
- Order cost or the set up costs,  $C_o$  fixed for each order
- No lead time, i.e., the procurement time gap after placement of the order
- Variable stock holding cost is  $C_h$  per unit per year
- Batch or lot size of order is  $Q$  (which we need to decide using this basic model)

With the above assumptions, the graph of overtime period takes the following shape:



Note: Allow stock to fall to zero as no time needed to replenish stock

Here we have that:

$$\text{Annual holding cost} = C_h (Q/2)$$

Where,  $Q/2$  is the average (constant) inventory level

$$\text{Annual order cost} = C_o (R/Q)$$

where  $(R/Q)$  is the number of orders per year ( $R$  used,  $Q$  each order)

$$\text{So total annual cost} = C_o (Q/2) + C_o (R/Q)$$

-Total annual cost is the function we wish to minimize, deciding the appropriate value of  $Q$ .

A purchase cost is associated with the  $R$  units per year. However, this is constant as  $R$  is fixed; so we can ignore it here.

The following diagram illustrates how change in these two components, i.e., annual holding cost and annual order cost influence the change in  $Q$ , i.e., the

ordering quantity. With the increase of  $Q$ , holding costs increase, but the order cost decreases. Thus, the total annual cost curve looks like:

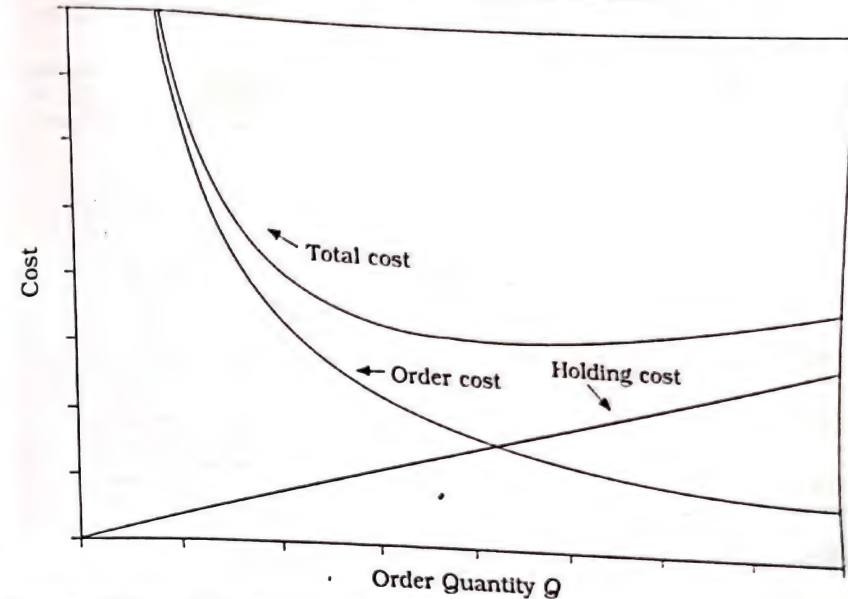


Figure 23.3A: Total Annual Cost Curve

Using this we can calculate, at which level of  $Q^2$ , we can have minimum total costs. Let us now look at the following equation:

$$d(\text{total cost})/dQ = C_h/2 - C_o R/Q = 0 \text{ for minimization}$$

$$\text{which gives } Q^2 = 2 C_o R/C_h$$

Hence the best value of  $Q$  (the amount to order = amount stocked) is given by  $Q = (2R C_o/C_h)^{0.5}$

This is known as the Economic Order Quantity (EOQ)

Example:

An organization expects to sell 200 units of an industrial product per year. The storage cost for per unit of refrigerator is Rs 20 per year. Costs for ordering are Rs 35 per order, and the rate of interest is close to 10 per cent per year. Total cost for one unit is Rs 100. Using the EOQ formula, compute the economic ordering quantity for this item.

Solution:

$$EOQ = (2R C_o/C_h)^{0.5}$$

In this case,  $R = 200$ ,  $C_o = 35$  and the holding cost  $C_h$  is derived as follows:

$C_h = \text{Rs } 20$  (direct storage cost per unit per year) +  $\text{Rs } 100 \times 0.10$  (rate of interest, which is an opportunity cost for the loss of interest, when the item remains unsold for a year)

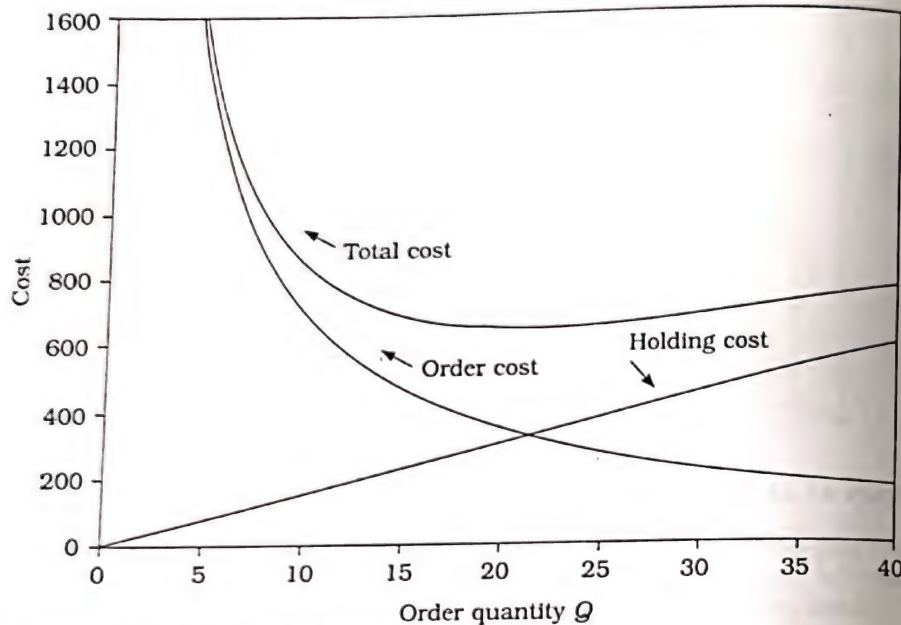
i.e.,  $C_h = \text{Rs } 30$  per unit per year

Hence  $EOQ = (2R C_o / C_h)^{0.5} = (2 \times 200 \times 35 / 30)^{0.5} = 21.602$

As we cannot order for the fractionated unit, we consider  $EOQ$  as 22.

Hence,  $EOQ = 22$  units.

We can illustrate this calculation using the diagram below:



Note: Total cost curve usually flat near  $EOQ$

**Figure 23.3B:** Total Annual Cost Curve

With this figure of  $EOQ$ , we can compute our total annual cost as under:

$$\text{Total annual cost} = C_h(Q/2) + C_o(R/Q)$$

$$\text{Total annual cost, therefore, would be } (30 \times 22/2) + (35 \times 200/22) = 330 + 318.2 = \text{Rs } 648.2$$

**Example:**

Let us take another look into the above problem. Assume that the company decides to order for twenty units in each order, instead of twenty-two units purely for some internal reasons. What would then be the extra cost for the company for deviating from the  $EOQ$  value?

With a  $Q$  of 20, the total annual cost would be:

$$= \text{Rs } (C_h Q/2) + (C_o R/Q)$$

$$= \text{Rs } (30 \times 20)/2 + (35 \times 200/20) = \text{Rs } (300 + 350) = \text{Rs } 650$$

Therefore, the extra cost for deviating from the  $EOQ$  would be the difference between Rs 650 (total annual cost for 20 units) and Rs. 648.2 (total annual cost for  $EOQ$  units, i.e., 22), i.e., Re 1.8

## SUPPLY CHAIN MANAGEMENT AND INVENTORY CONTROL

A supply chain indicates the network of facilities and distribution available to an organization to procure and distribute materials. Effective supply chain management not only benefits an organization by sourcing materials and transforming those into finished products but also by distributing the same to the end users in the most cost-effective manner. Supply chain management principles are applicable both for the manufacturing and service industries; however, its extent and manners differ from organization to organization.

In inventory control, supply chain management helps, as it ensures procurement services to customers on real-time basis, following the logic of just-in-time. By extending help to an organization, supply chain management greatly

### Supply Chain Decisions

Supply chain decisions can both be strategic and operational. Strategic supply chain management issues are aligned with the overall strategies of the organization, and usually viewed from the long-term perspectives. Operational supply chain management issues are taken for the short-term, focusing more on day-to-day activities. Some of the strategic and operational decisions influenced by the supply chain considerations are—(a) location of the unit, (b) production process, (c) inventory control (d) transportation (distribution).

### Location Decisions

Location decisions are concerned with the concentration of production facilities, stocking points and sourcing in appropriate places. It involves a long-term resource commitment on the size, number and the possible paths for the flow of products and services to the customers.

Location decisions have a significant impact on the bottom line (profitability) and the top line (sales and revenue) of the organization.

### Production Decisions

Production decisions are concerned with the items to be produced in different plants or units of the organizations, when organizations have the presence in number of locations. Such plant- or unit-wise production scheduling has significant impact on the sales and revenues, costs and the overall customer services.

### Inventory Control Decisions

These decisions refer to inventory control issues in the organizations. Effective supply chain management can reduce the level of inventories of raw materials, semi-finished and finished goods. Such decisions make use of push or pull deployment strategies, policies on control, optimum level of stocks, ordering and re-ordering level, safety stock level and even on the location of stocking.

### Transportation Decisions

The choice of mode of transport to ship materials is also strategically linked with the inventory control decisions. Customer service levels and geographic locations play vital roles in such decisions.

## LEAD TIME

Lead time is the time required between the moment we are aware about the need for stock and the actual replenishment of stock. It can either be internal or external. *Internal lead time* is the time period after the need for additional stock is realized, and the order is placed. It includes the time taken to review the demand, trade inquiries, tenders, quotations and the final approval from the higher authorities. *External lead time* is the time taken by the supplier to supply the materials after it receives the order.

## JUST-IN-TIME

Just-In-Time (JIT) concept enhances the excellence in manufacturing operations. It ensures wastage minimization. Wastage minimization is achieved ensuring movement of materials at right place at right time. JIT ensures minimization of the non-value-adding activities, by proper synchronization of all operational activities, focusing on elimination of wastage on labour, materials and costs. In fact, it is also considered as another quality improvement step. Inventory control in materials management can be achieved through JIT practices, when organizations focus on vendors development and source the materials on as and when required basis. Wal-Mart's less than 1 per cent inventory carrying costs is basically possible for successful JIT practices. Every Wal-Mart store is visited by all vendor representatives during closure hours to replenish the materials on shelf spaces to ensure that optimum quantity of items are available for next day's trading. EOQ is also another tool for JIT practices. Indian organizations are, however, not so far successful in implementing JIT, resulting unnecessary wastage and rising cost burden. JIT benefits the organization in terms of colossal costs savings and strengthen its competitive advantages.

## SUMMARY

Materials are one of the vital resource inputs in any production process. Conventionally, for any organization, five M's resource inputs are vital. Five M's are Men, Machines, Materials, Money and Management. In many manufacturing organizations, the cost of materials alone happens to range from 40 per cent to 60 per cent of the total expenditure. Obviously, a better management of material is essential to achieve organizational success. This chapter has discussed about various activities involved in materials management. To take an example, how to plan and control materials, how to purchase materials, how to do value analysis of materials and the process of physical distribution of materials. Selective inventory control techniques like, ABC analysis, SDE analysis, GOLF analysis, SOS analysis, FSN analysis, XYZ analysis, etc., have been explained with suitable examples. Various EOQ techniques and their applicability in different situations have also been explained in this chapter. Finally in this chapter, we have also discussed about supply chain management and inventory control.

## Key Words

**Selective Inventory Control:** It means variances in the method of control from item to item based on a selective basis. The criterion used for the purpose may be cost of the item, critically, lead time, consumption procurement difficulties or something else.

**Order Cost:** This cost is the purchase cost or set up cost, and it is arrived at by summing up the fixed costs that are incurred by the organization every time the order is placed.

**Inventory Carrying cost (Inventory Holding Costs):** It is also called holding cost. Carrying cost is the cost associated with having inventory on hand. It is primarily made up of the costs associated with the inventory investment and storage cost.

**Stock Holding Costs:** They are incurred while keeping the stock over time. Other costs are already indicated above are, storage costs, rent/depreciation, labour, overheads (like: heating, lighting, and security), costs for money being tied-up, i.e., loss of interest, opportunity cost, costs of obsolescence, stock deterioration (lose money if product deteriorates whilst held), theft/insurance, etc.

**Supply Chain:** A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products and the distribution of these finished products to customers. Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm.

**Supply Chain Decisions:** We classify the decisions for supply chain management into two broad categories—strategic and operational. As the term implies, strategic decisions are made typically over a longer time horizon. These are closely linked to the corporate strategy, and they guide supply chain policies from a design perspective. On the other hand, operational decisions are short term and focus on activities over a day-to-day basis. The effort in these types of decisions is to effectively and efficiently manage the product flow in the 'strategically' planned supply chain.

There are four major decision areas in supply chain management: (a) location, (b) production, (c) inventory, and (d) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

**Lead Time:** Lead time is the time required between the moment we are aware about the need for stock and the actual replenishment of stock. It can be either internal or external.

**Just-in-Time:** Just-in-Time (JIT) is a process for achieving excellence in a manufacturing company based on the continuing elimination of waste. Waste is considered as those things which do not add value to the product. It accomplishes this by moving material to the necessary place at the necessary time. Each operation is closely synchronized with the subsequent ones to make that possible.

## REVIEW QUESTIONS

1. Explain the concept of materials management function. What are the activities involved in materials management?
2. How does inventory control relate to materials management function?

3. What is selective inventory control? How is such control ensured?
4. For a steel manufacturing organization, suggest some selective inventory control measures.
5. Explain the concept of supply chain management. How does it relate to inventory control?
6. Short Notes:
  - (a) ABC analysis
  - (b) SDE analysis
  - (c) GOLF analysis
  - (d) SOS analysis
  - (e) FSN analysis
  - (f) XYZ analysis
  - (g) EOQ variables

## REFERENCES

1. Bhattacharyya, Dipak Kumar. 1999. *Productions and Operations Management*. New Delhi: Excel Books.
2. Cohen, M.A. 1997. *Manufacturing Automation*. Irwin: Chicago.
3. Konz, Stephen. 1983. *Work Design: Industrial Ergonomics*, 2nd edition. New York: John Wiley & Sons.
4. Chase, Richard B., Nicholas J. Aquilano, and F. Robert Jacobs. 2002. *Operations Management for Competitive Advantage*. New Delhi: Tata McGraw-Hill Publishing Company Limited.
5. Schmenner, R.W. 1995. *Service Operations Management*. Englewood Cliffs, N.J.: Prentice Hall.

## Index

### A

- Abraham Maslow 21, 24, 139
  - Absenteeism 322
  - Adhocracy 72
    - characteristics of 73
  - Administrative theory 18
    - fourteen principles 19-20
    - six activities of 18
  - Aggregate planning 353
    - methods of 354
    - steps to be followed in 354
  - Andrew Ure (1778-1857) 16
  - Ansoff's product/market matrix 493
    - diversification of 494
    - market development of 494
    - market penetration of 494
    - product development of 494
  - Assignment or job loading 375
  - Attitude measurement 113
    - Likert scales of 115
    - semantic differential of 115
    - Thurstone scales of 114
  - Attitude survey 116
  - attitude scales of 119
    - Likert's item analysis of 120
    - Likert's summated rating scale of 119
    - myth statements of 116
    - sample questionnaire items for 117
  - Authority delegation 84
    - barrier to 85
    - elements or features of 84
- ### B
- B.M. Bass 176
  - Bank wiring observation room experiment 23
  - BCG growth-share matrix 490
    - categories of 490
    - limitations of 492
  - Break-even analysis 370
  - Break-even chart 371
  - Budgetary control 202
  - Budgets
    - characteristics of 45
    - classifications Yardsticks 46
    - purpose of 46-47
    - reporting of 47
  - Bureaucracy 72
  - Bureaucratic organization
    - characteristics of a 20
  - Bureaucratic theory 20
  - Business organizations
    - forms of 218

### C

- Capacity and material requirement planning 355
- Capacity measurement
  - different types of 358
  - installed capacity 358
  - licensed capacity 358
  - process of 358
  - rated capacity 360
- Capacity planning 356
  - illustration on 357
- Cause and effect diagram 449
- Centralization vs. Decentralization 87
- Charles Babbage (1792-1871) 16
- Charles Duplin (1784-1873) 16
- Chris Argyris 21, 24
- Classical school of thought 16
  - limitations of 21
- Collective bargaining 326
  - characteristics of 329
  - importance and need for 329
  - prerequisites for 330
  - role of government in 328
- Communication 287
  - behavioural influence on 293
  - definition and concepts of 288
  - elements of 288
  - introduction of 287
  - nature of 289
  - psychological influence on 293
- Communication barriers 295
  - external barriers of 296
  - methods of overcoming 298-276
  - organizational barriers of 296
  - personal barriers of 297
- Competencies 31
- Competitive forces analysis 498
  - availability of substitutes of 498
  - bargaining power of customers of 498
  - bargaining power of suppliers of 498
  - entry restriction of 498
  - Michel porter's 498
  - rivalry of 498
  - types of 498
- Contemporary school of management thoughts 26
- Contingency theory approach 26
- Control charts 461
  - choice of control station of 462
  - choice of quality characteristic of 462
  - choice of rational sub-groups of 462
  - choice of the type of 462
  - demerits of the 464
  - frequency and size of samples of 462

- guidelines for preparing 462
- setting up of 463
- Cooperative organization 222
  - advantages of 222
  - disadvantages of 222
- Coordination
  - definitions of 206
  - external 214
  - importance of 209-211
  - introduction of 206
  - nature and characteristics of 207-209
  - needs of 209-211
  - objectives and purposes of 212-213
  - principles of 211-212
  - significance of 209-211
  - tools for better 215
  - types of 213-214
- Counselling interview 282
- Criticisms of Hawthorne experiments 23
- Cross relationships 94
- D**
  - Dalton E. McFarland 4
  - Dasgupta 4
  - Decentralization
    - criteria for 88
  - Decision making 55
  - Decision support system (DSS) 58
    - elements of 58
  - Decision tree 56
  - Decisions
    - advantages of 89
    - checking of 88
    - effects of 88
    - importance and significance of 88
    - limitations of 89
    - obstacles to 90
    - the number of 88
  - Delegation
    - clarity of 86
    - principles of 86
    - share authority of 87
    - the exception principle of 87
  - Delegation vs. Decentralization 85
  - Departmentation 75
    - balance of 75
    - by functions 76
    - by locations or territories 79
    - by process and equipment 80
    - by product 78
    - by services 78
    - by time 79
    - control of 75
    - coordination of 75
    - cost of 76
    - grouping by customers 80
    - human side of 75
    - hybrid structure of 80
    - local conditions of 76
    - matrix structure 81
    - patterns used in 76
    - principles of 75
  - process of 76
  - sections of 75
  - specialization of 75
  - Direct group relationships 94
  - Direct single relationships 94
  - Direction
    - characteristics of 132
    - meaning of 132
  - Distribution channels 481
  - Douglas McGregor 21, 24
  - Dynamic organization structure 75
  - E**
    - E.F.L. Brech 4
    - Economic ordering quantity 510
      - basic model of 513
      - EOQ variables of 510
      - graphical solution of 512
      - total cost function of 510
    - Edwin Flippo 155
    - Effective communication 289
      - common frame of reference of 290
      - compatibility in communication language of 290
      - compatible environment of 290
      - mutual congruence of 290
    - Elton Mayo 21, 22
    - Elton W. Mayo 138
    - Employee empowerment 452
    - Employee socialization process 125
      - encounter stage of 126
      - metamorphosis stage of 126
      - pre-arrival stage of 125
    - Environment and leadership 168
    - Equipment failure
      - types of 430
    - Ergonomics
      - concept and definition of 410
      - ergonomics' relation with management 412
    - External analysis 489
  - F**
    - F. Fielder 176
    - F.W. Taylor 4, 17, 18
    - Facilitator
      - objectives of 457
    - Factors determining span
      - ability of executives 96
      - availability of staff assistance 98
      - capacity of subordinates 97
      - degree of decentralization 97
      - delegation of authority 97
      - nature of work 97
      - territorial continuity of functions supervised 97
      - time required to be spent on supervision 97
      - use of objective standards 97
    - Flexible control 191
    - Forecasting 48
      - cause-effect model of 49
      - Delphi technique of 53
      - exponential smoothing of 51
      - manpower 49-50
      - market research of 54
      - moving average method of 50

- nominal group method of 54
- qualitative model of 49
- steps in 48
- time series analysis of 49
- types of 48
- Formal and informal leaders 165
- Forward-looking control 191
- Four framework model 181
- Frank and Lillian Gilbreth 18
- Frank B. Gilbreth 16
- Frederick W. Taylor 16, 138
- G**
  - Gantt or bar charts
    - advantages of 384
    - disadvantages of 386
  - George R. Terry 4
  - Globally integrated enterprises 226
  - Group communications 294
- H**
  - Harold Koontz 4
  - Henri Fayol 16, 18
  - Henry L. Gantt 16
  - Henry Laurence Gantt 18
  - Henry Robinson Towne (1844-1924) 16
  - Hersey and Blanchard's 176
  - Howard M. Carlisle 4
  - HRD
    - and attitudinal change 121
    - as a separate personnel discipline 235
    - concepts of 236
    - development of 237
    - education of 237
    - employee empowerment of 121
    - focus of 241
    - focusing more on team spirit of 122
    - imparting knowledge of 122
    - management of 241
    - objectives of 238
    - promoting quality circles of 122
    - role and significance of 240
    - role of consultants in 245
    - role of manager of 244
    - structure of 242
    - training of 236
  - HRD climate 248
  - HRD matrix 249
  - HRD culture 248
  - HRM vs. Personnel management 234
  - Human engineering and machine design 415
  - Human resource framework 181
  - Political framework 182
  - Human resource management
    - development process of 231
    - factors responsible for development of 233-234
    - history of 230
- I**
  - Illumination experiments 22
  - Implementation control 44
  - Index method 378
  - Individual decision making 258
    - non-rational models of 260

- perception-based 259-260
- Induction 124
  - components of 124
  - importance of 126
  - objectives of 124
  - steps in 125
- Industrial management 1
  - organizational behaviour 2
- Industrial relation (IR) 307
  - apolitical theories of 307
  - broad areas of 307
  - general policy on 324
  - political theories of 307
- Industrial relations and labour welfare in india 308
- Industry
  - code of discipline in 325
  - Industry cost structure 480
  - Internal analysis 489
  - International organizations
    - features of 226
- Interview 122
  - direct planned 123
  - group 123
  - indirect or non-directive 123
  - panel or board 123
  - patterned 123
  - stress 123
- Interview phase 23
- Inventory control 517
- ISO 9000:2000 444
- ISO 9001:2000 444
- ISO 9004:2000 444
- ISO standards 443
- J**
  - James L. Lundy 4
  - Job sequencing or prioritization 379
    - dispatching of 386
    - rules of 379
  - John F. Mee 4
  - Johnson's rule 383
  - Joint stock company or corporation 221
    - advantages of 221
    - disadvantages of 221
  - Joseph Massie 4
  - Just-in-time (JIT) inventory control systems 503, 518
- K**
  - Key success factors 481
- L**
  - Labour Laws and Acts 309
    - Environment Act 315
    - Factories Act, 1948 309
    - Group Insurance 314
    - Industrial Disputes Act, 1947 310
    - Maternity Benefits Act 314
    - Other Mandatory Acts 315
    - Shops and Establishment Act 314
    - Social Benefits Coverage 315
    - The Employees' Provident Funds and Miscellaneous Provisions Act, 1952 313
    - The Industrial Employment (Standing Orders) Act, 1946 310

- The Minimum Wages Act, 1948 312
- The Payment of Bonus Act, 1965 313
- The Payment of Gratuity Act, 1972 313
- The Payment of Wages Act, 1936 312
- The Trade Unions Act, 1926 311
- Trade Unions (Amendment) Act, 2001 311
- Workman's Compensation Act 314
- Labour turnover 323
- Language of leaders 185
- Lawrence A. Appley 4
- Lead time 518
- Leader / Deputy leader 457
  - role of 457
  - functions of 457
- Leadership
  - attitudes of 173
  - autocratic style of 172
  - behavioural theory of 184
  - characteristics of 161
  - climate of 169
  - conceptual skill of 174
  - contingency theories of 175
  - continuum of 180
  - culture of 169
  - definitions of 161
  - democratic style of 172
  - factors of 167-168 situation 168
  - famous studies on 177
  - functions of 169-170
  - great man theory of 185
  - human skill of 174
  - informal 175
  - inspirational theories of 175
  - instrumental theories of 175
  - Iowa leadership studies on 177
  - laissez-faire style of 172
  - Michigan studies on 177
  - miscellaneous theories of 182
  - Ohio state leadership studies on 177
  - paternalistic style of 172
  - path-goal theory of 176
  - personal skill of 175
  - principles of 166-167
  - significance of 165-166
  - situational theory of 184
  - styles of 179
  - technical skill of 175
  - theories of 175
  - trait theory of 183-184
- Leadership and management 163
- Leadership and power 171
- Lillian M. Gilbreth 16
- Line and staff conflicts 92
  - clarity in relationships 93
  - completed staff work 93
  - different backgrounds 93
  - dilution of authority 92
  - encroachment on line authority 92
  - holding staff accountable for results 93
  - lack of accountability 92
  - lack of demarcation between line and staff authority 93
  - lack of proper authority 93
  - lack of proper understanding of authority 93
  - lack of proper use of staff 92
  - proper use of staff 93
  - resistance to new ideas 93
  - theoretical basis 92
- Line and staff distinction 91
- Line and staff relations 91
- Line managers and HRD 246
- Line of balance chart (LOB) 387
- M
- M. Gene Newport 4
- Maintenance 421
  - breakdown 422
  - corrective 423
  - different types of 422
  - introduction of 421
  - predictive 423
  - preventive 422
  - spare parts planning and control in 424
  - total productive 423
- Maintenance capacity
  - assessment of 428
  - learning curve of 428
- Maintenance management
  - descriptive methods used in 431
  - replacement theory of 434
  - simulation of 432
- Maintenance policy
  - need for 424
- Management
  - A.V. Graicunas' theory of 94
  - as a profession 14
  - as a science or art 14
  - characteristics of 9-13
  - classical approach of 94
  - decision-making' orientation of 5
  - ergonomics' relation with 412
  - features of 9-13
  - human relations' orientation of 5
  - importance of 13
  - leadership orientation of 5
  - meaning of 3
  - nature of 3
  - participation of workers' in 324
  - process of 3
  - process orientation of 5
  - productivity orientation of 5
  - span of 94
  - various approaches of 94
- Management by objectives (MBO) 31
- Management functions 5
  - control 8
  - coordination 8
  - direction 8
  - organizing 7
  - planning 6
  - staffing 7
- Management information system (MIS) 58
- Managerial competencies 29
  - general business 30
  - interpersonal 30
  - supervisory 30
  - technical 30
- Managerial grid 178
- Managerial roles 28
- Managerial skills 29
  - general business 30
  - interpersonal 30
  - supervisory 30
  - technical 30
- Manpower training
  - avoiding obsolescence for 267
  - developing human skills for 268
  - imparting trade specific skills for 268
  - improving performance for 268
  - need for 267
  - stabilizing work force for 268
  - updating knowledge for 267
- Manufacturing plant 339
- Manufacturing resource planning (MRP-II) 361
- Market analysis 479
- Market profitability 480
- Market segmentation 481
  - basis of 482
  - behavioural 483
  - demographic 483
  - geographic 482
  - need for 481
  - psychographic 483
  - requirements of 482
- Market size 479
- Market growth rate 480
- Market trends 481
- Marketing and selling
  - difference between 478
- Marketing environment 496
  - internal environment of 497
  - key perspectives of 496
  - macro-environment of 497
- Marketing functions
  - scope of 477
- Marketing management 477
- Marketing manager
  - functions of 479
- Marketing mix 485
  - categories of 485
  - distribution (place) decisions of 486
  - limitations of the 486
  - price decisions of 485
  - product decisions of 485
  - promotion decisions of 486
- Marketing planning 487
- Mary Cushing Niles 4
- Mary Parker Follett 21
- Maslow and Herzberg's models
  - comparison of 144
- Master production schedule (MPS) 355
  - functions of 355
  - methods of 355
- Material cycle 503

- Materials management
  - definition and concepts of 502
  - main issues in 502
  - types of 502
- Materials requirement planning (MRP) 360
- Max Weber 16, 20
- MBWA model 450
- McKinsey/general electric matrix or industry matrix 492
- McKinsey's 7-S framework 27
- Measurement
  - interval scales of 110
  - levels of 109
  - Likert scales of 112
  - nominal scale of 109
  - ordinal scales of 110
  - ratio scales of 111
  - semantic scales of 111
- Method study 404
  - basic procedure of 405
  - detail procedures of 407-408
  - importance and objectives of 405
  - process or mechanism of 405
  - role of 405
  - steps of 405
- Micro-multinationals 226
- Milestone charts 388
- Mintzberg's managerial roles 2, 28
- Modern approaches 24
- Moller's competency model 451
- Monte Carlo simulation 432
- Motion economy 413
- Motivation
  - achievement need (nAch) of 146
  - affiliation need (nAff) of 146
  - attribution theory of 151
  - cognitive or process theories of 148
  - content theories of 153
  - critical evaluation of 143
  - elements of 133
  - equity theory of 149
  - ERG theory of 145
  - evaluation of the theory of 149
  - expectancy theory of 148
  - goal setting theory of 152
  - Herzberg's two-factor theory of 141
  - hierarchy theory of 141
  - importance of 138
  - in organization 133
  - locus of control of 151
  - McClelland's three needs theory of 146
  - mechanism of 136
  - miscellaneous theories of 152
  - motivation-hygiene theory of 141
  - objectives of 135-136
  - performance satisfaction theory of 150
  - perspective theories of 152
  - power need (nPow) of 146
  - process theories of 153
  - theories of 134
  - theories of 138-144
  - theory X and theory Y of 146-147

- Motivation and morale 155  
 Multinational or transnational organizations 223  
   advantages of 223  
   disadvantages of 224  
 Multi-skilling 31  
 N  
 Negotiation 302  
   understand the scale of disagreement of 304  
 Neo-classical school of thought 21  
   behavioural theories of 21-24  
 Network analysis 388  
   benefits of 388  
   critical path calculation of 393-397  
   critical path method (CPM) of 389  
   defects of 388  
   different forms of 389  
   PERT/CPM networks of 390  
   PERT/PEP technique of 389  
   rules of 391  
 New product  
   profitability projection analysis of 367  
 New product planning 365  
   new product development of 365  
   product selection process of 365  
 New product selection or development process 366  
   exploration of 366  
   screening of 366  
 O  
 Operating characteristic curve 459  
 Operational control systems 45, 343  
   functions of 351  
 Operations management 340  
   successful practices of 371  
 Operations manager  
   engineering of 344  
   industrial engineering of 344  
   inspection of 344  
   interdepartmental coordination of 344  
   maintenance of 344  
   production of 344  
   production planning and control of 344  
   role of 343  
 Operations strategy  
   factors of 342  
 Organization 68, 74  
   attributes of 69  
   classical theory of 68  
   neo-classical theory of 68  
   open systems approach in 98  
   structure of 69  
   systems of 69  
   systems theory of 68  
   systems view of 68  
   theories of 68  
   types of 67  
 Organizational behaviour 252  
 Organizational communication 290  
   business communications of 292  
   communication technology and electronic communication of 293  
   human relations and team building of 292  
   international communication of 293  
   managerial communications of 292  
   report writing of 293  
   sales communication of 292  
   transactional analysis of 299  
   types of 292  
 Organizational control 189  
   characteristics of 190  
   definitions of 189  
   essentials of 191-193  
   importance of 199-200  
   introduction of 189  
   methods for 197-199  
   policies for 197  
   prerequisites of 193  
   shortcomings of 200-201  
   steps in control 195-196  
   three types of 193-195  
   tools and techniques of 201-202  
 Organizational effectiveness 74  
 Organizational structure 70  
   activity analysis of 70  
   components of 71  
   decision analysis of 70  
   design of 74  
   developing an 74  
   in a globalized world 82  
   objectives of 70  
   relation analysis of 70  
   types of 71  
 Organizational suitability 191  
 Organizing 63  
   basic principles of 65  
   definitions of 64  
   human factors in 66  
   important steps in 66  
   terms of 64  
 Organizing function 66  
   benefits of 66  
   control of 67  
   coordination of 67  
   encouraging growth of 66  
   encouraging human use of 67  
   facilitating management of 66  
   importance of 66  
   stimulating creativity of 67  
   technological improvement of 66  
 P  
 Pareto diagram 137  
 Partnership 220  
   advantages of 220  
   disadvantages of 220  
 PDCA cycle 447  
 Perception 253, 258  
   as a process 254  
   factors influencing the 256  
   principles of 258  
   sub-process of 255  
   theories of 256  
   types of 258  
 Performance appraisal 274  
   functions of 274  
   importance of 274  
   methods of 275  
   modern methods of 278-280  
   objectives of 275  
   steps to 280  
   types of 275  
 Performance counselling 280, 282  
   conditions for 281  
   different phases of 281  
 Personnel management in India  
   developmental process of 232  
 Pest analysis 495  
   economic analysis of 496  
   factors of 495  
   political analysis of 495  
   social analysis of 496  
   technological analysis of 496  
 Peter Drucker 4  
 Peter F. Drucker 24  
 Peters and Waterman 27  
 Placement 126  
   importance of 126  
 Planning 35  
   capital investment constraint 59  
   components of 37  
   contributions of 36-37  
   importance of 36  
   limitations of 58  
   non-control over external factors 59  
   rapidity of change 58  
   time and cost constraints 58  
 Policy 37  
   administering 39  
   communicating the 39  
   comparisons between strategy and 43  
   considerations in 38  
   guidelines for 39  
   origins of 38  
   purposes of 38  
   responsibility for 38  
   ROM with other management functions  
   interrelationship of 339  
 Pre-classical approach 15  
 Premise control 44  
 Process selection 369  
   factors influencing 369  
 Product / service life cycle analysis 368  
 Production  
   scheduling of 375  
   sequencing of 375  
 Production and operations systems  
   mathematical models of 338  
   models for 338  
   schematic models of 338  
   verbal/written/descriptive/physical models of 338  
 Production management 334  
   descriptive model of 335  
   inputs model of 335  
   outputs model of 335  
   process model of 335  
 Production planning 349  
   functions of 350  
   objectives of 350  
   scope of 350  
   steps in 350  
 Production system 339  
 Production-related forms 361  
 Productivity 466  
   definition of 467  
   difficulty in 471  
   factors to improve 468  
   measurements of 470-471  
 Productivity and quality 472  
 Programme 40  
 Project  
   crashing of 397  
   definition of a 397  
   main characteristics of a 398  
 Project life cycle 399  
 Project management 399  
 Q  
 Quality  
   four absolutes of 446  
 Quality 439  
   cost of 441  
   importance of 441  
 Quality and HRD linkages 447  
 Quality and innovation and creativity 454  
 Quality and six-sigma practices 454  
 Quality circles and total employee involvement 455  
 Quality gurus and their contribution 445  
 Quality management  
   principles of 442  
   product quality to 442  
 Quality of work life (QWL) 453  
 Quantitative school of thought 24  
 R  
 R.C. Davis 4  
 Recruitment 103  
   definition of 104  
   functions of 104  
   internal recruitment of 105  
   recruitment policy of 105  
 Recruitment process 105  
   major sources of 106  
   preliminary screening of applicants of 107-108  
   psychological testing of 109  
   reference checking of 108  
 Relay assembly test room experiments 22  
 Reliabilities 430  
 Rensis Likert 24  
 Robert L. Trewatha 4  
 Robert Owen (1771-1858) 16  
 Routing 352  
 S  
 Sampling 459  
 Scaling techniques for attitudinal mapping of 109  
 Scenario planning 261  
   economic issues of 262  
   forces of 262  
   political issues of 262

- social dynamics of 262
- steps for 263
- technological issues of 262
- Scientific management approach 17
  - drawbacks of 18
- Selective inventory control 504
  - ABC analysis of 505
  - FSN analysis of 509
  - GOLF analysis of 509
  - HML analysis of 506
  - SDE analysis of 508
  - SOS analysis of 509
  - VED analysis of 506
  - XYZ analysis of 510
- Skills inventories 30
- Sole proprietorship 219
  - advantages of 219
  - disadvantages of 219
- Special tripartite committees or industrial tripartite committees 324
- Stanley Vance 4
- Statistical process control 458
- Steering committee
  - objectives of 456
- Strategic and marketing planning
  - key issues in 487
- Strategic planning 486
- Strategic point control 192
- Strategic surveillance 44
- Strategy 40
  - comparisons between policy and 43
  - framing 41-43
  - functional 41
  - grand 41
  - levels of 40
  - strategic control of 43-44
- Structural framework 181
- Superior-subordinate relationships 94
- Supervisory training programme 269
- Supply chain management 517
  - decisions of 517-518
- SWOT analysis 488
  - limitations of 489
  - multiple perspectives needed of 488
- Symbolic framework 182
- Systems theory approach 25
- T**
- Teams and teamwork 452
- Theo Haimann 4
- Theory Z concepts 26
- Time and motion study 17
- Top and middle management
  - communication of 270
  - control of 269
  - coordination of 269
  - decision of 270
  - inspiration of 270
  - integration of 270
  - motivation of 270
  - planning of 269
  - training of 269
- Tracking forecasting error
  - tracking signal for 54
- Trade unions 315
  - criteria for recognition of 322
  - history of 315
  - membership of 321
- Training 266
  - definition of 267
  - purposes of 267
- Training methods 272
  - apprenticeship 272
  - case study 273
  - conference 273
  - e-learning 274
  - group discussions 273
  - job instruction training 272
  - lectures 273
  - off-the-job 272
  - on-the-job 272
  - programmed instruction 273
  - role playing 273
  - simulation 272
  - t-group 273
  - training centre training 272
  - vestibule training 272
- Training policy
  - need for a 271
- Training programme
  - breaking objectives of 271
  - choosing methods of 271
  - classification of 268
  - deciding on packages of 271
  - designing the programme of 271
  - identification of training needs of 270
  - induction and orientation of 269
  - selecting strategies of 271
  - sequence of a 271
  - steps for designing the 270
- Transnationalism 226
- V**
- Value analysis 416
  - advantages of 417
  - steps in 416
- Virtual or networked organizations 83
- W**
- Wide vs. narrow spans 95
- William G. Scott 4
- William Spriegel 4
- Work breakdown structure (WBS) 387
- Work measurement 408
  - other techniques of 410
  - techniques of 409
  - time study of 409
- Work study 403
  - human context of 404
  - impact of ergonomics on 411
- Worker-focused control 192
- Y**
- Yoder Dale 155

# INDUSTRIAL MANAGEMENT



In today's complex business environment, engineering and management issues cannot be segregated. Integration of industrial management with the technicalities of engineering functions yields better results. Keeping in mind the needs of engineering degree and diploma students, **Industrial Management** focuses on the basic concepts of management and all other management-related aspects, which are considered essential for engineering students. The book would certainly be most effective in the coverage of its content, as it was developed based on the syllabuses of various universities and technical institutions both in India and abroad.

## Key features

- Equips students to apply various managerial tools and techniques for improved decision-making
- Reinforces engineering knowledge and skills with management inputs, to groom the engineering students as future managers
- Uses simple and lucid language keeping in view the need of the students
- Includes illustrative examples, models, mathematical problems and solutions to help students relate to the theoretical explanations

**Dr Dipak Kumar Bhattacharyya**, Professor, Xavier Institute of Management, Bhubaneswar, has over three decades of experience in teaching human resource management at the undergraduate and postgraduate levels. He was earlier the Corporate Director, Camellia B-schools; Dean of Indian Institute of Social Welfare and Business Management, Kolkata; Director of Institute of Engineering and Management, Kolkata, and also of Centre for Management Education, All India Management Association, New Delhi. He was also a visiting professor at XLRI, Jamshedpur and IIFT, Delhi. He has more than 15 years of professional experience in the area of human resources and is an active trainer and consultant. He has authored 10 books on human resource and management issues. Dr Bhattacharyya has also made extensive contribution to more than 100 articles and papers in journals of both national and international repute.

## VIKAS® PUBLISHING HOUSE PVT LTD

E-28, Sector-8, Noida-201301 (UP) India

Phone: +91-120-4078900, Fax: +91-120-4078999

**Regd. Office:** 7361, Ravindra Mansion, Ram Nagar, New Delhi-110055, India

E-mail: [helpline@vikaspublishing.com](mailto:helpline@vikaspublishing.com)

Website: [www.vikaspublishing.com](http://www.vikaspublishing.com)



V18CASF6PS